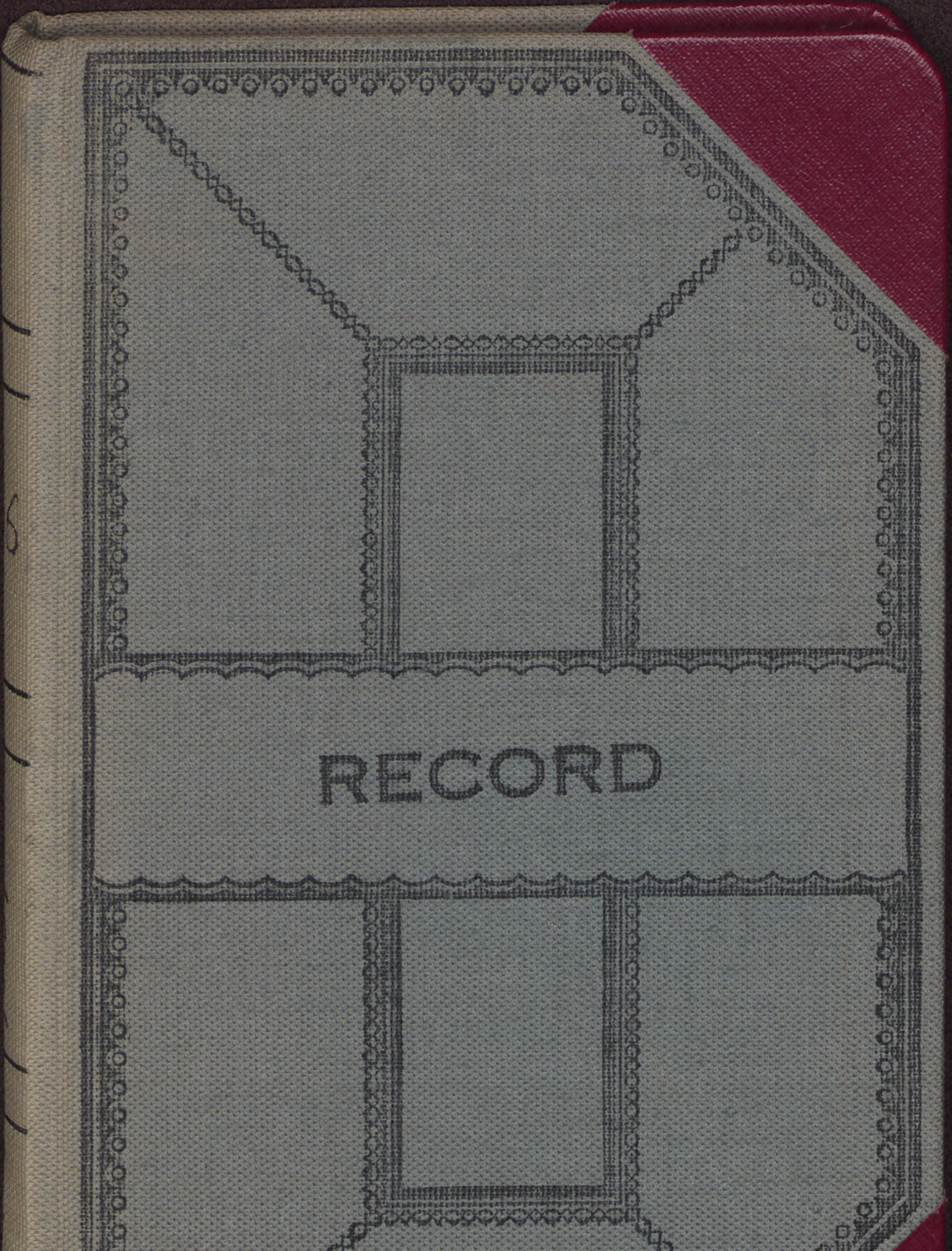
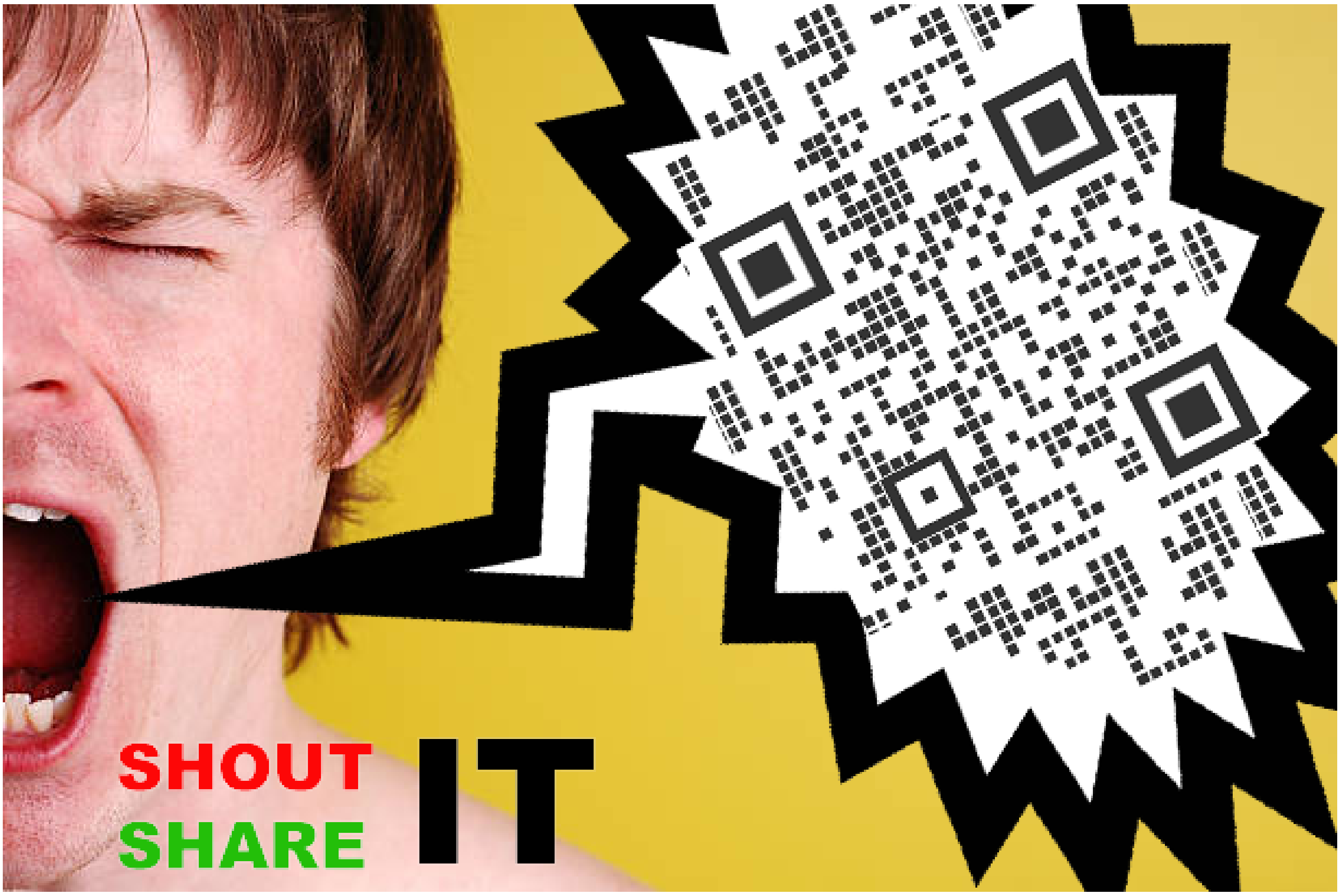


RECORD


SHOUT
SHARE
IT

Mongu
30 mi
45 mi.

Senior Tr. asst.
Pankole

Ivy Nash

Book #56

56

[illegible] undersigned. Liberal reward.

F.R. Fosberg

Field and Collection Note Book

No. 56

(Oct. 28, 1959 -- May 8, 1960)

(40723 - 40839)

Page

IVORY COAST.......... 1
Flight Abidjan-Accra.......... 2-9

GHANA (Accra Airpt) 40723-40730.......... 10-25

Flight Accra-Lagos.......... 22-30

NIGERIA 29-113
Ikeja, Lagos.... 40731-40733.......... 31-37
Auto trip Lagos-Ibadan 38-41
Flight Ibadan-Jos.......... 49-64
Ibadan.......... 43-48
Hill Station, Jos.......... 64-65
Jos.......... 66-68
n. of Narraguta, n. of Jos 40734-40737.......... 68-69
Hill Station, s. of Jos 40738.......... 68-69
Auto trip Jos-Mongu plains.......... 74-81
Naraguta.......... 40739 82-83
on plateau, s. of Jos 40740-40743.......... 82-83
Mongu Forest Reserve...40744-40747 82-85
s. of Jos 40748 84-85
Hill Station, s. of Jos 40749.......... 86-87
Flight Jos-Kaduna.......... 86-89
Kaduna.......... 90-99
e. of Kaduna, w. of Kaduna 40750-40752 100-101
Air trip Kaduna-Karo 102-105
Kano..........40753-40758... 105-109
Auto trip 110-113

SPAIN

Barcelona.......... 114-115
Flight Barcelona-Paris.......... 116-120
Flight Paris-London 120

CALIFORNIA 122-131
Auto trip Berkeley-Laytonville 128-129
Coast near Westport 130-131
Northern Calif. Coast Range Preserve 40759 130-131

VIRGINIA

Shenandoah National Park

Hogback Mountain 40760-40773.......... 132-133
Elk Wallow Shelter 40774-40794.......... 134-135
Whiteoak Canyon Trail (Limberlost) 40795-40803.......... 136-137
40804-40823.......... 138-141
Skyline Drive 40824 140-141

Fairfax County

1 mile n. of Centerville 40825-40828...... 140-141
Arlington Blvd..........142
s.e. of Sunset Hills 143
4501 Kirby..........144-145
Ball's Bluff (Loudon County) 146-147

NEW YORK (Ulster County)

Lake Mohonk.......... 148-149

VIRGINIA (Shenandoah National Park)

Skyline Drive...40829-40830.......... 150-151
Swift Run Gap...40831-40832.......... 150-151
Hunter Valley, n. of Oakton 150-151
Difficult Run 152-153
Bowman Place, Great Falls 154-155
Sleepy Hollow, north of Centreville (Fairfax) 156-159
40833.......... 158
Rail trip Washington-Philadelphia.......... 160

FLORIDA (Dade County)

Everglades National Park 162-165
Coconut Grove 166-169
Coral Gables, Matheson Hammock 40834-40839.......... 170-171

Mongu
30 mi. [illegible]
45 mi.

Senior Tr. asst.
Pankole

Tony Nash

Book #56
#56

begin #40723
40839

Standard B&P Blank Books and Loose Leaf Devices Trade Mark Registered

Standard Miniature Blank Book

No. 665	9½ x 6	120 Pages Units
No. 667	9½ x 6	200 Pages Units
No. 668	9½ x 6	300 Pages Units

Made in the Following Rulings

Journals, Day or Cash Books, Double $ and Cts.
S. E. Ledgers, $ and Cts.
Double Entry Ledgers
Records with Margin Line

When ordering give Number and Ruling desired

Made in U. S. A.

A BOORUM & PEASE PRODUCT

Property of Dr. F. R. Fosberg
c/o National Research Council
Washington 25, D.C. U.S.A.

If found, please communicate
with undersigned. Liberal reward.
F. R. Fosberg

1959 Ivory Coast

In the coastal area the most intensive agriculture is in the bottom lands at the mouths of streams, as at mouth of Banko R. Gardening on hilled-up black wet soil.

Banana plantations also, especially on these bottom lands.

The reddish brown sands that make up the terrace are extremely deep - cuts 10 m. deep show nothing but uniform sand, not visibly bedded, but with vertical and slanting cracks, origin of which is obscure, some, but not much slumping even where cuts are almost vertical.

Roads in this sandy area, where not asphalt, are surfaced with red lateritic gravel-sand mixture, or broken up crust material, which packs very firmly, perhaps hardens some.

No vultures seen in Ivory Coast.
Very few mosquitoes anywhere at least at this season.

Oct. 28 - flight Abidjan-Accra - right side of plane.

Around Abidjan airport Catharanthus is a very abundant weed. Away from actual strip is mostly low open scrub 1-3 m. tall, much tangled with vines, some grassy areas, much of area a closed scrub, probably because of vines. Sand showing between bushes in some areas.

Departed 11:30.

Eastward the savannas form a rather extensive system between the inner lagoon and the coastal lagoon as far as Grand Bassam. Between this and the coastal lagoon is an extensive belt of thicket, with ~~extensive~~ considerable Raphia, patches of swamp and open black water. The coastal bar, outside the coastal lagoon is largely planted to coconuts. It is rather narrow.

East of Grand Bassam is thicket and forest with

angular cleared patches, very sandy, and a canal paralleling the coast for a long distance. Some patches of white sand in from beach. Some small grass areas. Beach sand and much of interior sand rather tawny to grayish tan. Clearings, cultivated and abandoned, more abundant eastward immediately back of beach.

11:43 Inland the forest is degraded, some patches of grass.

11:44 The canal terminates in a narrow coastal lagoon, separated by a very narrow bar, scarcely more than a beach-ridge, from sea. This bar largely cleared and planted to coconuts, these very young.

Inland from lagoon is thicket and some forest, largely cleared along lagoon. Back of this a narrow belt of savanna, some of it with closed grass, some very open and sandy, almost desert-like. Has a parallel texture, perhaps

of old beach ridges.
This ends at first
river, which is black
water. a canal enters
lagoon west of river, also
11:56 black water.
East of the stream a winding
channel to northeast, back
of beach ridge extensive
thicket and swamp.
with small black
water lagoons near
beach, larger muddy
ones away from coast.
Some clearings here,
especially on beach ridge
and around lagoons, but
greater part of land between
beach and main lagoons
wooded. Floating grass
along edges of lagoons.
Local white sand patches
with scrub near beach
ridge between black water
ponds and lagoons.
11:54 Much of beach ridge
land cleared and planted
to young coconuts. Back of
this sandy land probably
old clearings, some small
savannas. Forest back
of this then lagoon.
Variation eastward
of this pattern, but no

lagoon. much forest,
villages numerous on
beach ridge, very orderly
in appearance.
12:04 a black water lagoon.
Eastward considerable
savannas just back
of beach ridge. Still
many villages and palm
plantations on beach ridge.
12:08 Course a bit more away
from beach. Savannas
fewer. Villages fewer, one
or two inland.
Vegetation generally a
mosaic of small
clearings, abandoned
clearings in various
stages of regrowth,
and somewhat larger
patches of forest.
Continues eastward to
where coast turns somewhat
southward (perhaps near
12:13. Axim.)
12:15 Rather far inland
much broken cloudiness
but much good forest,
few clearings.
12:17 Some clearings along
roads, but generally
good forest, so far as
visible.
12:19 A large clearing with

1959 Ghana

an establishment in center, apparently a sugar plantation, with clearing operations in progress in eastern part. Around this especially south of it, a mosaic of clearings, regrowths, and forest. Mosaic continues eastward.

12:22 Approach coast again Sekondi-Takoradi; the mosaic here is mostly clearings and young regrowth, little forest. Many villages. Soil orange-red. Two fairly extensive towns on two eastward pointing hooks of coast. Coast cuspate to eastward, cusps pointing eastward.

12:25 Considerable savanna eastward, some forest fully ½ cleared, perhaps. Large villages on coast

12:24 We are out over sea. Cloudy inland

12:30 On right considerable savana, changing inland to clearings and forest

12:31 Rather extensive savanna patches extending more

inland. Then a mosaic of cultivation, grass, forest. this extending farther and farther inland.

12:35 a large city.

Then grassy to thinly forested or scrub country back of beach.

An important road paralleling coast, villages or small towns between it and coast. Soil orange-red.

12:37 Mosaic of cultivation and forest extending inland. Some roads going inland

12:39 Impression with rather poor visibility is that there is more thicket or forest than clearing.

12:40 Extensive savanna. Little forest. This extends eastward. Some cultivation but locally.

12:41 Areas of scrub or thin forest. Some cultivation along roads.

12:43 Country becomes more cultivated, but still with much scrub and savanna. More scrub and scrub-forest eastward, becoming almost continuous thin forest, but with a few conspicuous savannas, green clearings.

12:45 An extensive savanna. — probably the Accra Plain (widely spaced tufts of scrub — said by Nye to be on ~~towns~~ dead termite mounds), matrix green, becoming paler eastward, with some patches of forest, becoming tawny-green.

12:47 River mouth with considerable system of lagoons and sand flats and bars.

12:48 A small city

Then extensive savanna.

12:49 Many villages.

Gallery forest, open grass, savanna.

12:50 Thin forest or scrub — uneven, locally cleared, locally more dense.

More cleared eastward, soil red.

12:51 another small city.

Extensive savannas.

Rather tawny in color.

Gallery forest.

All this a strip along coast, forest inland in distance.

savanna [illegible] drier eastward, but [illegible] course more away from land.

12:55 Forest approaches coast, but with savanna areas back of it.

12:56 Then savanna and lagoons and bars along coast.

12:57 Some very rectangular plantation, much burned cleared land, much savanna and cultivation mosaic.

12:58 Large city surrounded by savanna-cultivation mosaic. Accra.

An extensive city, not at all congested. Patches of savanna, largely cultivated, extending into it. Plenty of trees in town, but not generally green - trees scattered. East of town extensive savanna, considerably burned but scarcely cultivated. Doubtless the termite savanna mentioned by Nye. Grass here closed brownish green. Trees and brush clumps abundant.

1959 Ghana

Oct. 28 - Accra - Airport
Cultivated plants seen.
Parkinsonia aculeata
Delonix regia
Hibiscus rosa-sinensis × schizopetalus
A Codiaeum variegatum
Gomphrena globosa
Tagetes (several forms)
Zebrina pendula
Zinnia elegans
Petunia
Bougainvillea sp.
Polyscias guilfoylei
Azadirachta indica
Cassia spectabilis
Mangifera indica
Impatiens balsamea
Kalanchoe pinnata
Chrysalidocarpus lutescens
Salvia grahami ?
Canna (ornamental hybrids)
Casuarina equisetifolia
Ageratum houstonianum
Cassia fistula
Thunbergia grandiflora
Thunbergia alata (large white)
Plumeria rubra
Spathodea campanulata
Nerium sp.
Tecoma stans
Ceiba pentandra
Duranta repens
Thevetia peruviana
Lindernia angustifolia

This is a rather dry area, apparently because of curvature of coast which produces a sort of rain shadow.

Elaeophorbia juliflora is a very common tree here, starting especially on termitaries. It looks just like Hura crepitans, superficially.

[Prof. Sansome, head of Univ. Coll. Botany Dept]

Coleus scutellarioides
Caladium bicolor
(common red fld. acanth.)
Alternanthera versicolor
Catharanthus roseus
Pilea microphylla
Rhoeo spathacea
Calotropis
Celosia argentea
Cynodon dactylon
Gaillardia pulchella
Hibiscus rosa-sinensis
Jatropha gossypifolia
Brownea
Caesalpinia pulcherrima
Carica papaya
Solanum lycopersicum
Rosa sp.
Jatropha multifida
Lagerstroemia indica

1959 Ghana

Weeds
Euphorbia prostrata
Portulaca lutea
Eleusine indica
Chloris inflata
Sida acuta
Tridax procumbens
Boerhavia diffusa (red fl.)
Dactyloctenium aegyptium
Malvastrum coromandelianum
Euphorbia heterophylla
Alternanthera (pungent one)
Portulaca quadrifida?
Panicum maximum
Talinum
Phyllanthus
Cyperus cyperinus?
Euphorbia thymifolia?
Desmodium triflorum
Pennisetum? sp.
Mimosa sp.
Eragrostis amabilis
Hedyotis corymbosus
Euphorbia hirta
Cyperus rotundus
Clitorea ternatea
Sporobolus diander
Commelina sp. (closed spathe, 2 large blue petals)
Hyptis suaveolens
Crotalaria retusa?
Cenchrus echinatus or brownei
Vernonia cinerea
Tricholaena rosea
Stachytarpheta aff. jamaicensis

Cult. plants (ctd.)
Lawsonia inermis
Pithecellobium dulce
Anthurium (large, red spathe)
Hydrangea japonica
Chrysanthemum morifolium
Monstera deliciosa
~~Ceof~~ Pityrogramma calomelanos
Manihot esculenta
Capsicum frutescens
Ipomoea batatas
Hibiscus esculentus
Acalypha hispida
Acalypha godseffiana?
Spondias sp. (large round fruit)
Allamanda cathartica v. cathartica
Bauhinia sp. (5 stamens, long calyx tube)
Guaiacum officinale? (blue fls.)
Peltophorum ferrugineum
~~Eragrostis ciliaris~~
Sesamum indicum
Arachis hypogaea
Zea mays
Leucaena glauca
Tectona grandis
Ceiba pentandra
Terminalia catappa
Cocos nucifera
Albizzia lebbek
Hura crepitans
Tamarindus indicus.
Anacardium occidentale
Solanum melongena
Cordia sebastena!?

Photos (1-10)

Oct. 29 - Accra Airport

Gently sloping savanna, with tall Hyparrhenia (?) to 3 m. scattered shrubs and tufts of small trees and shrubs, these tufts marking old termitaries.

Mostly with a large Elaeophorbia, some Azadirachta shrubs, something like an Allophylus, and several other shrubs.

Patches of a lower grass resembling Ctenium. Open patches of a low (1m.) spiny Acacia (?)

Soil brown to red brown, fine and light to rather heavy and full of buck-shot concretions.

Scattered patches of poor manioc, Capsicum, sweet potatoes, okra, etc.

Tall irregularly conical termitaries, to 3 m. A few plants established on one. When a piece was broken off, exposing galleries, no termites were seen at first. Then large soldiers with enormous brown heads began to come forth and to run blindly

over the surface of the hill, many falling to the ground and running around on the ground, snapping their mandibles. Soon after workers appeared and began to deposit mud, and in a few minutes some of the smaller holes were walled over and walls were being built over many of the larger ones.

Many soldiers caught in spider webs on outside of hill.

Took half minute to 1 minute, for soldiers to appear.

Weeds observed (etc from p. 12)

Tribulus cistoides
Gomphrena
Emilia sonchifolia
Eragrostis ciliaris
Lantana camara
Passiflora foetida
Cassytha filiformis
Abutilon indicum?
Schwenkia americana
&

1959 Ghana

(labels sent) Oct. 29 – Accra Airport
weedy ground along paths

40723 Hedyotis corymbosus (L.)
1 common

1 24 Gomphrena
common

1 25 Emilia sonchifolia (L.) DC.
occasional in cultivated
places and around building.

1 26 Spigelia
common in cultivated places

1 27 Ctenium!
forming patches in savanna.

1 28

rare in cultivated places

1 29 Hedyotis corymbosa
rare in cultivated places

1 30 Pennisetum
common weed around dwelling

221'

prostrate, flowers white.

prostrate to ascending,
heads white.

leaves glaucous,
flowers purple.

flowers pale lavender.

tufted

branched at base.

erect.

loose tufts slightly
spreading at base, culms
erect.

1959 Ghana

Oct. 30 – ~~[illegible]~~ Accra Airport

Tall grass savanna below airport to s. w.

Several species of bushes and small trees are common –

Azadirachta indica
Bridelia sp. ?
Grewia sp. ? yellow fls.
~~Caesalpinia ?~~ Zanthoxylum
Croton or Mallotus 2 spp.
Capparis sp.
Cordia sp. ?
Acanth (brick red fls.) several others.

The termitaries are built right around living bushes which happen to be in the way or to have a branch in the way. The soldier termites that come out and swarm over the sides of the hills when a piece is broken off may apparently either go back in or fall to the ground. After a short time on the ground running about they die, at least when in the sun.

The termitaries are mostly a dull red (occasionally brown), so hard that they can scarcely be broken by the fist.

A cordia-like plant but with lvs. in whorls of 4, cymose panicles. A heavy-nerved plant with dense axillary fascicles of sessile fls. A ferociously spiny Dovyalis or something of the sort.
A tall Waltheria.
A foetid compound-lfed. slender shrub with apocarpous fruits.
Vernonia sp. (shrub. white fls in panicles, yellow pappus.)

A diverse lot of vines tangling the shrubs into thickets wherever they are close together.

The grass is dense in places, open in others. Where open the ground is usually eroded till the surface is a gravelly mass of concretions and quartz fragments.

Elaeophorbia is a thick stubby tree with a dense rounded crown of cereoid branches with large fleshy obovate green leaves.

1959 Ghana

At the bottom of this long gentle slope is a ditch about 2 m. deep, down through a red brown silt soil filled with fine gravel, top 2-3 dm grayish brown. Then the rather uniform red-brown material differing locally in redness and in amount of gravel.

Lies on a warped light colored phyllitic schist with quartz and light mica.

In manihot patches is a population of Euphorbia (Poinsettia) showing every leaf shape from narrowly linear to broadly elliptic, ovate, oblong or obovate, entire to deeply lobed. No color at base of top lvs.

There seem to be no vultures here, but Crows with a white ~~crescent~~ band across the breast and white head are fairly common.

One Borassus tree not far below Airport in savanna.

Oct. 31. Accra

Hedges of Thevetia peruviana.

Azedirachta, Spondias, Delonix, Mangifera, Cassia spectabilis (or siamea), Pithecellobium dulce, are the common street trees.

Hibiscus and Bougainvillea generally common.

A few coconuts in downtown area. A few Casuarina.

Coconuts show Oryctes damage.

The city is very open and spread out. Even the downtown area is scarcely congested. Trees are fairly abundant except in the central business district.

Harbor an open roadstead anchorage close in.

"Old Town" around waterfront squalid, crowded with one story shacks. Sidewalk market everywhere.

1959 Ghana

Christiansburg castle - built in 1790 by Danes as center for slave trade. Walls 2 m. or so thick, Windows heavily barred in slave quarters. Subsequently used as house of governor-general. Added to in 1950. Now being renovated for Prime Minister

Thespesia in castle enclosure. Coconut groves near castle.

Flat savanna between Christiansburg and airport photos

Oct. 31 - flight Accra to Lagos (left side of plane)

Soil inland from airport bright red where bulldozed.

Left ground at 3:58 p.m.

Landing field large, asphalted, being enlarged.

East from Lagos is a vast area of savanna, with several small towns scattered along coast.

Savanna looks badly overgrazed, with burned patches, one fire actually in progress. Several tidal inlets along coast.

Some coconuts along coast at towns. Between

the towns the savanna actually comes to the beach. Inlets have sandy margins with broken grass sod, no trees nor mangrove.

4:05 A railroad terminal and an artificial harbor with breakwaters. New town.

Inland the savanna is apparently completely uncultivated. The tufts of scrub are in most places very widely separated, locally dense, narrow gallery scrub follows stream beds.

Tidal inlets and small towns continue eastward.

Several fires seen.

4:13 Large coconut grove along coast. Patches of rather denser savanna inland, with sparse savanna and large areas of grass with no trees.

4:15 Large tidal lagoon with grass coming to its margins. Inland large patches of rather denser savanna or open scrub.

Near coast several patches of trees with villages in them. Along inner side of narrow bar separating lagoon from sea is a slight sparse development of mangrove scrub.

Coconuts along coast on bar to east. Eastern parts of lagoon change to sparse Avicennia (?) then to extensive marshes. These alternate with savanna on sandy patches extensive network of tidal channels. Then

4:20 a large estuary with islands, very marshy, swampy areas with palms and some other trees esp. a light green one like a willow

East of this winding channels and strips of marsh and patches of open palm forest and palm savanna, open swamp, dry savanna.

4:23 Extensive mixture of tidal marsh and swamp. with little dry ground. This seems to have artificial channels or paths in it. with water in them.

4:25 west side of an extensive lagoon system, with tall grass or reed brakes around many of its intricate

---

Ghana – Togo –

margins. Surrounded by extensive ~~[illegible]~~ tidal marsh. Some patches of dry sand with savanna on seaward side.

4:30 Keta. Coastal bar bounding lagoon swings northeast here. The bar is wide, mostly covered by the town. Town appears wooded, as does the bar and beach ridge to northeast.

East of lagoon the beach ridge is wooded, then a strip of savanna and lagoons, then a strip of forest, and, inland, extensive savanna.

4:33 The inner forest strip almost pinches out, and the coastal one broadens.

Togo We are so far at sea now that visibility is poor.

4:34 Savanna strip pinches out. A fair sized town – Denu or Aflao? or probably Lomé.

East of this, a broad wooded belt along coast, inside this green grassland, a narrow strip, with open forest or dense savanna back of it.

4:40 A large lagoon inland, but visibility now too poor.

1959 ~~Togo~~ - Dahomey

4:43 area between lagoon and sea seems wooded. A large channel from the lagoon extends east to a tidal inlet and a broad estuary inland.

4:47 Dahomey East of this the country seems more wooded - a mosaic of wood and savanna. Visibility poor. Mangroves along channels of estuary.?

4:51 River with narrow estuary. The rivers on this coast have their mouths deflected eastward. Considerable mangrove at mouth of this one. A narrow lagoon paralleling coast for a considerable distance eastward. Bar seems rather continuous so it is hard to tell just where the river mouth is. Several other rivers also enter this

4:54 lagoon, which continues eastward, with some substantial areas of mangrove or perhaps fresh water swamps, much cut by open water channels.

4:56 Area inland seems mostly marsh or wet savanna.

Bar is densely wooded but hard to tell if by mangroves or coconuts, from this distance.

4:56 Very large lagoon far inland. Visibility poor.

4:58 Lagoon continues eastward, now quite complicated.

4:59 Bar broad, covered by coconuts. Much broken cloudiness.

5:00 Considerable mangrove around lagoon. Mixture of swamp and marsh inland.

5:02 Lagoon quite narrow, but still with marshes behind it. Apparently country behind it is largely wooded, some savanna.

5:03 Behind lagoon, now very narrow, with mangroves, is a mosaic of savanna, marsh and forest. Coconut plantations, scrub, and pasture on bar.

5:05 Lagoon is now only a narrow channel lined with mangrove, then ends.

5:06 Some bits of marsh. Then, inland, a very large lagoon, separated from sea by mosaic of grass and forest (swamp?).

5:08 Cotonou. Large lagoon back of it connected with sea by broad channel. Lagoon surrounded by marsh and mangrove. East of town much white sand with open scrub — patches of this alternating with swamp and, eastward with palm (coconut?) plantation.

5:10 Large areas of marsh, some white sand, seaward of lagoon.

5:11 Another area of sand, but lagoon becomes a broad tidal marsh.

5:12 Sand forms what appear to be beach ridges slanting a bit away from coast, separated by marshes and swamps.

5:13 A large area of marsh with mangrove, then marsh, then open water inland.

5:14 Porto Novo, inland of large swamps and a wide arm of lagoon which winds eastward between marshes and mangrove swamps. Seaward are areas of scrub, gallery forest, and marsh.

Nigeria

5:16 Villages along coast. Arm of lagoon, lined by broad marshes with tidal channels, curves nearer sea. Land inland a mosaic of forest and savanna, predominantly forest, becoming more so eastward.

5:18 A few villages inland. Forest is dominantly Elaeis, some patches natural forest.

5:20 Another black water lagoon inland. The arm or channel from Porto Novo now close to sea.

5:21 The black water lagoon extends far inland. The other one parallels coast.

Course is now well inland. Country a mosaic of oil palm and banana patches

5:22 with broad strips of semi-deciduous forest. Some cultivated land. Strip of lagoon still continues along coast,

5:24 becoming more complicated. Inland a mosaic of patches of cultivation,

1959 Nigeria

regrowth and oil palms, in apparently catena relation to strips of forest, perpendicular to coast. This more and more irregular.

Some trees in forest are apparently in flower. Others bare.

5:27 Strips of swamp winding dendritically into interior, seem quite bare.

5:28 Mostly forest but rather degraded. Patches of what must be Musanga and of palms and bamboo, as we approach Lagos. Villages remarkably few, however, and even clearings are few.

5:30 Forest rather good, but with lots of palms (Elaeis).

5:31 Several concrete roads going north. Large clearings. We circle to right over outskirts of Lagos.

Open woods, thicket and cultivated patches. Very green.

Nigeria

Nov. 1 – Ikeja, Lagos

Cultivated plants seen:

Plumeria rubra
Caesalpinia pulcherrima
Canna sp.
Terminalia catappa
Delonix regia
Axonopus compressus
Euphorbia cyathophora
Pedilanthus tithymaloides
Elaeis guineensis
Bougainvillea spectabilis
Polyscias guilfoylei
Hibiscus (ornamental hybrids)
Hymenocallis littoralis
Xanthosoma sagittafolia
Musa
Carica papaya
Allamanda cathartica v. hendersonii
Codiaeum variegatum
Caladium bicolor
Portulaca grandiflora
Thryallis glauca
Polyscias guilfoylei
Nephrolepis biserrata ?
Breynia nivosa
Cassia spectabilis (? siamea)
Bauhinia sp.
Coleus scutellarioides
Cordia sebastena
Artocarpus altilis
Acalypha hispida

1959 Nigeria

~~??~~ NW. Ikeja, Lagos
~~S~~ Weeds seen.
Euphorbia hirta
Eleusine indica
Momordica charantia
Synedrella nodiflora
Sporobolus diander?
Eragrostis amabilis
Stachytarpheta jamaicensis
Cynodon dactylon
Euphorbia prostrata
Cyperus cyperinus
Dactyloctenium aegyptium
Portulaca quadrifida
Amaranthus viridis?
Hedyotis corymbosa
Peperomia pellucida

In several oil palms near Ikeja Rest House were colonies of weaver birds, with many pouch shaped nests. The birds were working busily and noisily on the nests.

Compound stipules of Delonix regia

The stipules are asymmetrically bipinnately compound, with the main rachis linear-subulate, slightly arcuate, up to 15 mm. long, pointing in more or less the same direction as the rachis of the leaf, somewhat laterally compressed, tapering to a subulate point, with usually a ventral blunt tooth or umbo, or merely a
...n 3-4 mm. from
The concave
...his is toward
leaf, and
...side. Along
...er ~~leaflets~~ pinnae,
...e reduced.
...endage or
...3 in all) absent,
the second
not be
well developed
~~leaflets~~ pinnae, on this side, are elliptic to elliptic-obovate, up to 10 mm. long and 3 mm. wide, conspicuously cucullate-mucronate or apiculate. The third one is usually somewhat larger than the second and fourth, and it is rarely

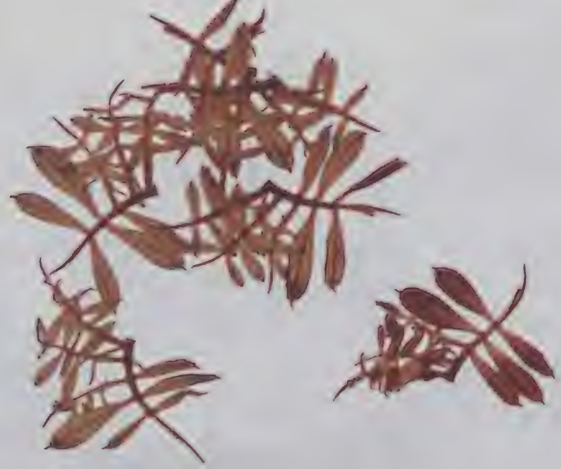
the mucro slightly laterally compressed

Lagos nigeria

stipules of Delonix regia for description.

Lagos
nigeria

stipules of
Delonix regia
for description.



1959 Nigeria

NW.: Ikeja, Lagos
Weeds seen
Euphorbia hirta
Eleusine indica
Momordica charantia
Synedrella nodiflora
Sporobolus diander?
Eragrostis amabilis
Stachytarpheta jamaicensis
Cynodon dactylon
Euphorbia prostrata
Cyperus cyperinus
Dactyloctenium aegyptium
Portulaca quadrifida
Amaranthus viridis?
Hedyotis corymbosa
Peperomia pellucida

In several oil palms near Ikeja Rest House were colonies of weaver birds, with many pouch shaped nests. The birds were working busily and noisily on the nests.

Compound stipules of Delonix regia:

The stipules are asymmetrically bipinnately compound, with the main rachis linear-subulate, slightly arcuate, up to 15 mm. long, pointing in more or less the same direction as the rachis of the leaf, somewhat laterally compressed, tapering to a subulate point, with usually a ventral blunt tooth or umbo, or merely a sudden contraction 3–4 mm. from the apex. The concave side of the rachis is toward the rachis of the leaf, and is the forward side. Along this are three or four ~~leaflets~~ pinnae, the proximal one reduced to a subulate appendage or (when there are only 3 in all) absent, in which case the second one may or may not be reduced. The well developed ~~leaflets~~ pinnae, on this side, are elliptic to elliptic-obovate, up to 10 mm. long and 3 mm. wide, conspicuously cucullate-mucronate or apiculate. The third one is usually somewhat larger than the second and fourth, and it is rarely

the pinnae slightly laterally compressed furnished with 3 subulate curved teeth on the proximal margin. On the convex, outer ~~margin~~ side of the main rachis are five or rarely four pinnae, opposite those on the inner side. The distal ~~[illegible]~~ two or three of these are similar to those opposite them. The proximal two or more usually three pinnae are ~~compound~~ pinnately compound, with three or more usually four pair of lanceolate or oblanceolate cucullate to cucullate mucronate pinnules oppositely or somewhat irregularly arranged along a somewhat swollen to slightly compressed slightly backwardly arcuate rachis. The distal and proximal pairs may be reduced to subulate projections or to mere bumps. The apex is usually subulate but may rarely be expanded and similar to a pinnule but then quite asymmetric. On the ventral side of the rachis and of the secondary rachises, at the base of each pair of pinnules, is a ~~pat~~ small patch or irregularly transverse line of tiny black to pale brown very short hairs. The pinnae and pinnules are ~~[illegible]~~ sparsely puberulent with very minute antrorsely appressed hairs.

These stipules only occur on fast growing branchlets, and as growth slows down they become progressively reduced with each successive leaf. They are ~~[illegible]~~ early caducous, disarticulating, and are not normally present on mature twigs.

1959 Nigeria

labels written

Nov. 15 Ikeja, n of Lagos,
in borders of garden

40731 Hedyotis corymbosa
2 common

1 32 Phyllanthus
common

1 33 Emilia sonchifolia (L.) DC.
occasional

prostrate to erect; corolla white.

erect

somewhat glaucous, flowers purple

6:40 p.m.

Nov. 1 – trip by auto from Lagos to Ibadan.

Elaeis abundant, breadfruit common. Landscape along road a mixture of gardens and thickets. Xanthosoma commonly cult. also Zea.

miles 10960

Low places swampy and filled with Raphia.

3–4 km out of town thickets more abundant than gardens.

65 small river.

Much marshy and swampy land, semi open.

66 River on left.

Pennisetum purpureum very common in this bottom-land, between thickets, scattered Elaeis

68 Much open marsh.

Crossed river.

Tangled swamp forest. Pistia + Nymphaea in open ponds.

69 Swamp and Cyperus marsh

Some degraded tall forest

70 Crossed large river.

More swamp. Then dry

71 ground mostly cleared.

Musanga becomes occasional.

72 Mostly low tangled viney scrub, some cultivation.

73 almost no forest. Some Elaeis. Villages ([illegible]!)

74 Open, partly scrub thicket, partly cult. Bananas, Citrus, Zea.

Thicket of various ages. Anthocleista occasional.

76 Thicket with Elaeis, banana patches.

79 village.

High tension line follows road.

80 Thicket with some patches of poor forest. Elaeis is abundant.

83 Mixed Thicket. Elaeis grove, patches of ~~[illegible]~~ secondary forest, a few bamboo clumps. cultivation

84 village

Cola plantations?

86 Cultivation (manioc), Cola, Elaeis, Cacao, thickets.

87 Konigbagbe Sta.

Generally Cola plantation

Rounded trees 6–8 m tall.

Scattered Elaeis. Cola trees touching or almost so.

91 Mostly low thicket.

93 Shagamu.

96 Swampy forest, then higher ground, mostly thicket and cultivation.

97 Bananas, Elaeis, patches of forest, cacao plantations.

98 Cola. Cacao.

99 Open area and low thicket,
Ifon – fair-sized town.
02 mixed cacao, shifting cult.
thickets. Elaeis.
03 open shifting cult. scattered
Elaeis, some groves.
06 Cacao plantations.
08 Thicket, patches of forest,
cultivation, Elaeis groves.
09 some swamp, Cacao. Thickets.
10 Cacao plantations.
12 mixed cult & cacao. Scattered
tall trees. Elaeis.
14 Degraded forest, some Elaeis.
15 Shifting cult. with Elaeis
and scattered tall trees.
17 Cacao, not much shaded.
18 Shifting cult. & Elaeis.
19 Cacao young Elaeis, mixed
shifting cult. Maize, manioc,
Xanthosoma, bananas,
20 Cacao, not much shaded.
22 Ola Oribadan ? (town)
Mostly cacao
23 Cacao, Cola, some Elaeis.
24 mixed cult. and thickets.
25 cacao, mixed cult, Elaeis.
29 thickets, some ~~[illegible]~~ cult.
30 Cola & cacao, mixed cult.
31 Cacao
32 Elaeis & cacao, cola.
No more tall trees except
locally & Elaeis
33 Cacao.

34 Cacao with some Tall trees.
35 Shifting cult. Thickets.
scattered Tall trees, Elaeis
& bits of woods. Cacao.
36 a low hill on right with
rather degraded high forest.
37 Some deciduous trees,
bamboo thickets, Elaeis
groves.
38 scattered patches of tall
grass (Pennisetum)
with thickets and Elaeis
groves.
39 Country becomes mostly
open, tall grass savanna
with Elaeis, other trees,
cultivation.
40 Ibadan.
A vast sea of rusty galvanized
iron roofs with an occasional
fleck of green where a tree
shows through – and
swarms of people.

The road from Lagos to
Ibadan runs through what
is mostly a mosaic of
shifting agriculture – small
patches of cultivation and
thickets of varying ages.
tangled with vines – and
patches of cacao, either
shaded or not, and of
Cola – small dense rounded trees,

groves of oil palms and scattered individual oil palms, with here and there swampy or marshy areas, either thickly wooded or with grass or sedges, and occasional scraps of poor degraded high forest. Ceiba does not seem to be especially common. Scattered tall trees of various species are left throughout the area. Musanga is seen here and there but is nowhere abundant.

From the road perhaps thicket seems to occupy a higher proportion of the land than it actually does as narrow strips of thicket along the road may cut off the view of garden patches and cacao plantations.

No. 1 Ibadan —

Cultivated or planted species seen:

Codiaeum variegatum
Breynia nivosa
Cassia sp. virgate shrub with very small leaves and very showy fls.
Thryallis glauca
Axonopus compressus
Canna sp. (purple lfd. small fls)
Cleome spinosa
Lantana camara (orange, not prickly)
Rosa sp.
Alocasia macrorrhiza
Pedilanthus ~~t~~ tithymaloides
Tectona grandis
Alstonia sp.
Ixora coccinea (sessile lvs. acute or obt.)
Caesalpinia pulcherrima
Cynodon dactylon
Albizzia lebbek
Polyscias guilfoylei
Solanum lycopersicum
Carica papaya
Nephrolepis "duffii"
Tagetes sp.
Caladium bicolor
Alternanthera versicolor
Acalypha hispida
Zinnia elegans
Gliricidia sepium
~~Gossypium~~ sp.
Hibiscus mutabilis
Dahlia variabilis
Samanea saman

Nov.: Ibadan
Weeds seen
Paspalum dilatatum
Eleusine indica
Desmodium triflorum
Euphorbia prostrata
Sida acuta
Sida rhombifolia
Calopogonium mucunoides
Synedrella nodiflora

Cultivated species (ctd.)
Cassia siamea
Cassia spectabilis
Cassia nodosa
Antigonon leptopus
Xanthosoma violacea?
Lantana camara var. aculeata
Tamarindus indicus
Capsicum frutescens

Nov 2 - Idi Ayyire 12-13 mi
s. of Ibadan Gambari Forest.

Along river - Cynometra and Brachystegia eurycoma very common, and Cola laurifolia + Pterocarpus santolinoides. Uapaca heudelotii (stilt roots), Ricinodendron,

Back from the river scattered relict tall trees and a dense tangle of climbers and shrubs and saplings. The saplings, growing up, lift the canopy of climbers leaving open space between the stems of the saplings.

East of here a large forest very irregular, with considerable number of tall trees, irregular thin intermediate and lower storys, thick vines on ground. The intermediate trees were largely removed for firewood for a factory and power plant. Much climber removal has been done here, also, recently but regrowth is fast. Little regeneration seen.

Andropogon tectorum is a tall bluish grass, to 3 m. or more, common to dominant in the savanna around Ibadan. Pennisetum purpureum is the other abundant species. They do not grow in an intimate mixture but in patches.

Old field outside Ibadan, at Lafia Rest House - irregular open scrub of Gliricidia mostly about 4 m. tall, tangled with ~~gr~~ Panicum maximum and vines such as Clitorea, also Pennisetum polystachyon? + Imperata.

Pennisetum purpureum (called elephant grass, though Onochi has never heard of elephants eating it) is coarse, erect, to 4 (or 5) m. tall branched loosely toward the top. Spikes 15-20 cm long, perhaps 2 cm. thick, on long peduncles, exserted above the top reduced blade about 7-10 cm.

Habit not tangled.

Blades and sheaths scabrous, nodes with a ring of stiff bristles.

Another area of Gliricidia, nearby, that was probably similar has grown up to a thick coppice about 5–6 m. tall, the trees pollarded at about 1 m. and masses of wand-like shoots coming up, forming a closed canopy. No vegetation under this.

Charles Onochi says that almost the entire forest belt of Nigeria is a mosaic of shifting agriculture, regrowth, cacao, ~~and~~ cola, and oil palm, with some forest reserves that are much altered by man.

[He distinguishes Cassia siamea from C. spectabilis by the fact that the racemes are erect in C. siamea, hanging in C. spectabilis.]

Nov 3 – Ibadan airport
3 vultures seen (first seen in Africa). Square or slightly forked tails, dark sooty brown.

Nov. 3 – Ibadan – for flight DC-3 left side. Weather at Ibadan rather cloudy. Small dirt airstrip.

9:27 left ground.
Thickets of Gliricidia, low tangled scrub, and groves of Elaeis near airport. Around town mostly cultivated patches and low scrub. Few trees in town, which is crowded, except on hill which is densely planted to some sort of tree.
Patches of tall grass – mainly Andropogon tectorum near town, with scrub and cultivated patches, east of town.
Small villages numerous,
9:31 Elaeis abundant.
9:33 Visibility almost none.
9:35 Hole in clouds – mosaic of patches of cultivation and forest. Then no more visibility.
9:41 Slight hole – green shifting agriculture.
9:43 Holes in clouds – hilly country, partly cleared, some forest.
9:45 Same. perhaps 3/4 cleared. Elaeis common, in small groves.
9:46 Same. some signs of erosion.
9:47 Same, forest patches mostly Elaeis.

1959 Nigeria

9.46 another hole - crossed small muddy river running at about 25° to rt of course. Wooded.

9.50 Large hole - some savanna patches, some clearings some forest - about equal amounts. a small muddy river perpendicular to course.

9.57 Holes - hilly country, largely cleared, some patches of degraded forest, much regrowth, with scattered tall trees, occasional patches not too bad

9.58 A large granite dome, wooded on top, sides partly wooded, partly bare steep dark gray granite.

9.59 Then hilly country mostly in shifting agriculture, some patches of forest mostly rather degraded, scattered conspicuous light green trees, rather abundant, some Elaeis, but not very much except locally Banana patches.

10:01 Almost clear Hilly mor wooded but generally shifting agriculture and regrowth, villages

10.02 photos.

10:03-4 Forest becomes much less. gradual chang to savanna with Elaeis patches of pretty good forest

10:04 a granite exposure.

10:06 a town. and a number of villages, surrounded by forest, otherwise savanna with gallery forest, Elaeis groves, small forest patches, roads lined with Elaeis, many cultivated patches

10:07-8 Low granite hills, tops bare

10:09 Savanna becoming more prevalent, cultivation much less. forest much less.

10:10 Hilly country with many granite exposures, open forest to savanna. almost no cultivation. (photos) Little Elaeis.

10:11 Granite hills become very conspicuous (photos) especially in middle distance

10:12 Dense forest almost absent except for slight gallery development along streams

10:13 Some granite, still. Vegetation varies from savanna to open forest.

10:14 scattered cultivated patches.

1959 Nigeria

a village.

Savanna becoming dominant, open forest on granite hills except where there are bare patches. Elaeis has disappeared except for some in the narrow gallery strips along stream courses.

10:16 Almost all savanna.

10:17 Hills with open to rather closed forest, gentle slopes savanna, scattered cultivated patches. soil sand-color to red. Still some granite exposures. Hills in middle distance

10:18 Hilly but no granite. Hills are grassy with some small trees, ravines densely wooded (photo)

10:19 Savanna with dendritic streams with gallery (photo)

10:20 Granite dome (photo) Small river flowing somewhat to left of course, meandering, muddy.

10:21 Rolling country, mostly savanna, with gallery forest, stream joined by another from south.

10:22 Forest locally denser, dense to open with patches of savanna, low hilly

10:24 land. Scattered cultivated patches of cultivation with dead trees.

Savanna becomes more prevalent as land becomes less hilly.

10:25 Scattered small granite outcrops, not large hills. Gallery forest, savanna small areas of open forest.

10:26 Some small erosion scars. Mosaic of savanna, open forest, closed forest, in small ~~fa~~ very irregular patches, with gallery forest along streams, rather open.

10:27 Borassus common in open gallery forest along streams.

10:28 Borassus more common along a stream crossing course, forming groves.

10:29 Close mosaic of savanna, open & closed forest and gallery with some Borassus. Then some Borassus scattered in open forest and savanna. mostly however in gallery. No cultivation at all now for some distance.

10:30 Mostly open forest varying to savanna, gallery open & closed

1959 Nigeria

10:31 country becomes hilly
again, savanna on
ridges, open to closed
forest in ravines. (photos)
10:33 granite exposures.
10:34 A very light plug-like
butte with a red conical
top, ~~etc~~ otherwise black
granite exposures.
Savanna with gallery
forest. Borassus less
common a few Elaeis in
gallery
10:35 Not so hilly. a few
granite patches. Savanna
to open forest well developed
gallery along streams.
10:36 The streams apparently
incised. rather straight,
10:37 running into a consider-
able patch of forest which
seems to follow a depression
northward, becoming
broader to where it
reaches the Niger in
10:37 the distance. approaching
course almost perpendicularly
or at about 70°.
10:39 Mosaic of large savanna
patches, open scrubby
forest patches and dense
gallery. all with a
trend about parallel
with course of Niger.

10:40 Ponds and depressions
parallel to Niger, course
of old channels: in
wide bottom land
Braided pattern but
meandering less
conspicuous than
is usual in big tropical
rivers (photos)
10:42 Crossed Niger. Bottom
land largely savanna,
some swamps, some
marsh, some ponds,
these elongate some
channels. (photos) thatched village.
10:44 Eastward a mosaic of
rather large savanna
patches, patches of
open to closed forest, and
gallery. along principal
streams some bright
10:45 green cultivation & few
small patches of clearing
a bit away from stream.
10:46 Open forest along course,
savanna with gallery
forest to north.
10:48 Savanna with
broad gallery along
dendritic stream system.
(photos).
10:49 Savanna thickens to
open forest. Some cumulus
clouds.

1959 Nigeria.

10:50 Mostly open forest. Practically no cultivation

10:51 Forest thins to savanna locally

10:52 Open forest again. thinner in distance, then with gallery forest.

10:53 Forest thins to savanna again, with conspicuous gallery forest.

10:54 A few tiny villages and some cultivated patches in savanna.

Dendritic stream system trending to southeastward.

Houses in these villages circular.

10:55 Savanna, more cultivation, in middle distance a mosaic of small patches of forest and savanna.

Soil here a sandy color or pale brown.

10:57 Crossed a small river coming from about 35-40° left of course. somewhat meandering, joined by a smaller one from about straight ahead. Considerable cleared patches near where they join

10:58 Several more tiny villages.

Savanna has only few trees, some bushes here, Borassus along small river and its

10:59 tributaries gallery not well developed.

Scattered cultivation

11:00 several villages.

Small hilly patch in middle distance, with some open forest on slopes, tops savanna.

11:01 Considerable cultivation in savanna. Patches of open scrub with very thin grass. reddish soil. Soil in cultivated

11:03 patches tawny. Savanna begins to look overgrazed.

11:04 Gallery becomes more conspicuous.

11:05 Country hilly, open forest on slopes, savanna on tops and ridges. Range of hills trends north to northeast

11:06 Savanna, overgrazed. small villages.

11:07 Mosaic of cultivated patches overgrazed savanna and open gallery forest.

11:10 Striking granite blocks and domes in middle distance. Steep sides bare. Top of big one grassy, others either

1959 Nigeria

grassy or bare. On gentler
11:11 slopes either grass or small
thickets.
Small hills and domes
closer. Savanna with
gallery, little cultivation
but savanna overgrazed.
11:12 Flatter country, thin
savanna and pasture,
rather green. locally
reddish.

11:13 Large granite domes along
course, with bare slopes,
grass, thickets patches of
closed forest between the
hills. This extends north.
11:14 Less hilly but still
hilly country with
savanna, bare granite
patches, a few patches of
closed forest. slight gallery
along streams.
11:15 Same, less hills, a village or
two. still plenty of bare
granite.
11:16 More exposed granite.
Curious circular construction,
possibly thorn fortification on
bare granite hills.
11:17 Some open savanna
with granite patches
then large granite hills.

11:19 Savanna with sharply
developed gallery forest
on dendritic stream system
no granite, topography
rolling. Savanna
varying to grass without
11:20 trees locally.
Some heavy cumulus.
A few small cultivated
patches and a patch or
two of dense forest. Mostly
11:21 savanna with few
trees some bushes, narrow
gallery systems (photo)
11:22 Then a low granite
ridge trending northeast
with open forest, rather
irregular.
11:23 Rather flat savanna.
What appears to be a
circular hedge around
a fairly large area with
savanna and cultivated
patches.
11:24 several tiny white granite
exposures.
11:25 Parallel very low ridges
trending northeast, no rock
exposed except slight
apparent exposures in
beds of small streams.
This uncertain.
11:26 More granite domes right
along course. bare except

1959 Nigeria

for small grass (or sedge) spots on top and slopes (see Richard paper). This patch of hills running somewhat northeast but lower and little granite exposed.

11:28 Hills become lower and fade out along course. Then another large low dome just off course, running into a large area of rolling semi-exposed granite eastward and northward.

11:29 Then savanna where granite is not exposed, small patches of open forest and thickets. Some tiny white rock exposures on very hills, too. Can't see them well

11:30 Flat to rolling savanna, very open, with thin gallery forest, fuzzy with side ravines.

11:31 Main road running about 60° back from course.

11:32 Town built on west slopes of a large hill, top of which is bare granite. Another similar town and hill in middle distance.

11:33 Considerable patch of

low granite domes. bare or with small grass patches, some wood in ravines, but not much.

11:34 Open savanna but with scattered low granite exposures. Considerable cultivation locally. Some patches bright yellow-green.

11:35 Savanna without granite, very few trees except in broad open gallery forest. Considerable cultivation. A few Elaeis in gallery forest.

11:37 More granite patches, forming very low hills. Low series of domes running off northeast.

11:38 A road running northeast and much cultivation. A little more exposed granite. Course seems to be turning more to east or even south of east-
Rolling Country, open savanna. closely meandering streams, much cultivation.

11:40 A town with railroad yard. Much cultivation, some savanna. Gallery forest only very slightly developed if at all.

1959 Nigeria

11:41 Course about east
Mosaic of cultivation,
pasture. very narrow
stream
11:43 Scattered Borassus in
cultivated land.
Low hills with some
granite. Some bad
erosion. Cultivation
on lower flatter areas.
Hills overgrazed, trees
only locally. Small
clumps of houses - farm
sites abundant along
11:45 road more or less along
course. Open grassland
with no trees, red
erosion scars, away
from main road.
Another road with no
farms across this
Cultivated patches scattered
in grassland
11:46 More farms and much
cultivated land along
a small very red muddy
river crossing course at
right angles.
11:47 Rolling country, partly
cultivated, the rest
badly overgrazed and
eroded.
Some very small granite
exposures.

11:48 Savanna on very low
hilly country with
considerable but small
granite exposures, running
11:49 up to a ridge with an
abrupt scarp on southeast
side.
11:50 Then a stream valley
crossing course, then
low overgrazed hills
with patches of granite
and patches of cultivation
apparently of soil raked
up into windrows on
bare granite
11:51 a large low granite hill.
Then rolling overgrazed
reddish plain, partly
cultivated, some granite
knobs, these becoming
11:52 more abundant.
11:53 A very muddy, milky
brownish stream joining
course at a narrow
angle from back, then
crossing it.
11:54 Bad gully erosion on
rolling overgrazed, partly
cultivated plain.
a braided stream from
60° left of course, then
a long ridge of very
knobby granite hills
running parallel with

1959 Nigeria

11:55 this stream.
Then badly overgrazed
and seriously eroded
country, spotted with
granite patches
11:57 Approaching Jos airstrip.
More rough knobby
exposed granite.
Villages with thatched
steep conical roofs.
Cultivation on high ridges
of soil.
11:58 Landed.

Nov. 3 - Hill Station, Jos.
Built on a granite ridge covered by picturesque boulders. Landscaped, with abundant ornamentals. Hedges of Dodonaea viscosa.

Ornamentals seen:
Dodonaea viscosa (hedges)
Pelargonium zonale
Begonia (tall red, & very oblique lvs.)
Althaea (hollyhock)
Pilea microphylla
Ficus pumila
Mangifera indica
Acalypha godseffiana ?
Zebrina pendula
Kalanchoe pinnata
Salvia splendens
Malvaviscus

Tagetes (several forms)
Euphorbia pulcherrima
Dahlia variabilis
Plumbago auriculata
Catharanthus roseus
Plumeria rubra
Portulaca grandiflora
Rosa sp.
Duranta repens
Bougainvillea spectabilis
Dianthus caryophyllus
Zinnia elegans
Gmelina sp.?
Callitris sp.
Eucalyptus camaldulensis
Carica papaya
Mangifera indica

Nov. 3 – Jos
Mango is the commonest tree in the immediate outskirts of the town and

Road to north
Open high scrub to shrub savanna
Out a little it is very low shrub savanna, apparently over cut for firewood. Some scattered Eucalyptus camaldulensis
Then pasture with scattered mango and other trees, patches of sorghum.
Small villages of mud huts.
A small baobab
Trees become scarce. Most of land cultivated or in poor pasture, this with abundant small bushes or clumps of sprouts.
Granite hill with low open scrub.
Descending gradually. Much sorghum still.
Scrub becomes thicker but still 1 m or less tall.
Very few trees. Grass very thin. A few shrubby Acacia
Country flattens out, trees become more common, higher thin grass. Where there is scrub it is largely acacia.

Trees irregularly spaced, 5–25 m apart, mostly an Albizzia-like legume.
Grass badly overgrazed. (photo)
(photo) Sorghum patches 3–4 m tall.
A Bauhinia-like shrub very common. Grass 2–5 dm tall, open.

Back toward foot of grade - open scrub of Acacia and several other shrubs 1–1.5 (2?) m. tall, thin grass lower or of same height between them.
Adenodolichos
Principal shrub a papilionate legume with loose terminal panicles of small pink-green flowers, large trifoliate leaves.
Several other leathery-leafed shrubs, one quite spiny. The Acacia is like farnesiana but without odor and with flat narrow pods.
A number of other legumes.
4 photos
Locally Acacia dominant, mostly the large leafed one.
Small very hard rounded termitaria filled with clipped pieces of grass perhaps 1–1.5 cm. long.
end of roll A.
Small rocky hill covered by a sclerophyllous open scrub 1–1.5 m tall, large leafed.
[illegible]
Thin grass, close contour some paths

Bouldery hills covered by a large leafed sclerophyllous scrub of a number of species, 1-1.5 m. tall. Cow paths between shrubs. Great granite boulders. a few scattered twisted trees.

Nov. 3 - ~~edge of plateau~~ north of Naraguta, just north of Jos
in ~~sc~~ open sclerophyllous scrub at foot of hill of granite boulders.

labels written

40734 Vernonia
occasional

1 35 (Rug.)
common

1 36 Vernonia
occasional

= 37 rub.)
common

Nov. 3 - Hill Station, hills south of Jos
in crevices between great granite boulders

labels written

1 38 (bamboo) Oxytenanthera abyssinica (A. Rich.)
det McClure
common

4000'

erect, flowers bright purple.

shrub 0.4 m. tall, grayish.

rays maroon within, cream color without. corollas withered.

4700'

mumo

dense clumps, canes very tough, arching, 2-4 m. high, a fascicle of branchlets at each node, many small ones, one ~~B~~ central one elongating, many imbricate scales at base of these branchlets.

1959 Nigeria

Nov 3 - Hill Station south of Jos
Bouldery granite hills with patches of shrub savanna between the knobs of granite, the shrubs sclerophyllous, mostly legumes, 0.5 - 1.5 m. tall, the grasses up to 1 m. tall.

In the crevices between the boulders on the knobs are various shrubs, but especially a slender bamboo about 2-4 m. tall, canes arching, to 2 cm. thick.

The culm sheaths are, at this stage, somewhat loosened from the culms except in the middle of the base, and tend to curl. They are buff. Inside one was a tiny tree toad, about 2 cm. long, elliptic in outline, about the same shade of buff as the sheath but apparently with some ability to change color, as it got slightly darker on my hand. It seemed to adhere to the sheath, with its legs folded very close and under it. Its feet were orange, with suction disks. The belly seemed to form a suction disk also. When loosened it settled down on my hand, adhered

Hyperolius aff. montanus Angel

NATURE CONSERVANCY

a society to preserve living museums

Hyperolius
aff montanus Angel.
Kinan Gop Mts.
E Africa

Bell Rain Mus
30

Mts 2400 - 3100 m.

Walter Rose
Rept. & Amp. of Southern Africa.
Maskew Miller Capetown 1950

NATURE CONSERVANCY

a society to preserve living museums

Hyperolius
aff montanus Angel.
Kinan Gop Mts.
E. Africa

[illegible]

Bell Pass Mts.
30

Mts 2400 - 3100 m.

Walter Rose
Reptl. & Amp. of Southern
Africa.
Maskew Miller, Capetown
1950

1959 Nigeria

Nov. 3 - Hill Station, south of Jos

Bouldery granite hills with patches of shrub savanna between the knobs of granite, the shrubs sclerophyllous, mostly legumes, 0.5 - 1.5 m. tall, the grasses up to 1 m. tall.

In the crevices between the boulders on the knobs are various shrubs, but especially a slender bamboo about 2-4 m. tall, canes arching, to 2 cm. thick.

The culm sheaths are at this stage, somewhat loosened from the culms except in the middle of the base, and tend to curl. They are buff. Inside one was a tiny tree toad, about 2 cm. long, elliptic in outline, about the same shade of buff as the sheath but apparently with some ability to change color, as it got slightly darker on my hand. It seemed to adhere to the sheath, with its legs folded very close and under it. Its feet were orange, with suction disks. The belly seemed to form a suction disk also. When loosened it settled down on my hand, adhered

Hyperolius aff. montanus Angel

and seemed to huddle there. Stayed without moving while I wrote these notes. When disturbed it would spread its feet and hold on, then settle back, drawing its legs under it again. Its eyes were golden with horizontal black slits. The insides of its legs, where they fold against the body, are orange, the outside is buff.

When placed on a dark gray rock it turned slightly grayer but remained a dull tan. Apparently it was not able to change further. After it was disturbed further it became more active, hopping about and attempting to escape. When carried in the hand it tried several times to crawl out, then settled down and was quiet again.

Placed in an inverted glass it settled down on the side and didn't move.

The vegetation of the rocky knobs is varied. On bare rock faces there are thin crustose lichens, but many patches are bare from exfoliation.

Photos showing [illegible]

On flat places with very thin soil there is a thin sod of [illegible] Bulbostylis, about 2-5 cm high, spreading.

Various annual grasses and composites are found in crevices. Where there is some soil there are grasses, up to 1-2 m. tall, and a number of "podagrici" plants — what appear to be young Adansonia, 1-2 m. tall, and a number of others, several of them without leaves now. A white candelabraform Euphorbia, cylindrical, and a small Aloe are uncommon.

Several Vernonia species, herbs or shrubs, are found. Most curious of all is a Nephrolepis which is common in crevices seemingly completely dead and brittle at this season.

N. undulata

It is a narrow frond, 2-4 dm tall, very brittle. Digging at its base finally yielded some hard tuberous rhizomes, perhaps 5-8 mm. thick and 2-3 cm long. The stems from them are completely dead and brittle, as are the roots. Collected rhizomes and fertile segments to see if they can be grown.

The smaller grasses and Bulbostylis are dead, after 3 weeks without rain. The larger ones are flowering. The leguminous shrubs and the Compositae, as well as a most curious labiate, leafless and with terminal cones with overlapping scale-like bracts, which open up and the corollas protrude.

Vultures are rather common. 12 seen in air at once.

This is just about a month after the beginning of the six months dry season. It is said to be a very strong dry season, October ~~to~~ November through March or April.

Nov. 4 – Trip by auto Jos - Monga

Plains south of Jos between rocky hills are grassy, trees only along roads and around houses.

On rocky hills the white Euphorbia is abundant.

The plains are largely cultivated – sorghum & millet, & in pasture which is overgrazed.

Eucalyptus planted around towns and here and there elsewhere.

Area south of Bukuru spotted with holes and great mounds of earth which are old tin mines.

The hills to the south are more grassy, though still with many succulents and podagrics. Very small baobabs local.

photos

Tin mining on both large scale, involving large machinery and on very small scale, by hand digging and sorting.

Many small villages dotted over plain.

The tin occurs in a deep red to yellowish or mottled blue and red lateritic clay in form of black sand, & the clay

mill
25

is filled with concretions and thin crusts of various materials, mostly, I suppose, iron oxides. It is panned, using a half gourd. In the dry season the upper layers, 6-8 m. are too hard to dig. Working is done in a wet layer under a crust, with water which seeps out of it. A man may, if lucky, fill half a calabash in a week, which he must sell to the owner of the mine. He may get 2-3 pounds for it

Photos

Range of rather abrupt granite hills, more shrubby vegetation than usual, incl. a small palm (Phoenix ?), caespitose, stem slender. Cereid Euphorbia & spp. common. Trees very rare & cut for firewood.

Some flat topped erosion remnants with sloping sides and rim rock which seems to be a laterite crust.

Down a slight slope the general appearance of the vegetation becomes a bit more luxuriant and on the slightly lower plain wherever it is not cultivated is Parkia savanna. Some Vitex. Both trees protected by law.

Landscape badly eroded. Eroded parts sparsely shrubby.

Mongu. Market.

Peanuts. Black cakes from Parkia seeds, Brown cakes from peanuts. Taro. sweet potatoes. Cola. Guinea corn (sorghum) Long millet. Pearl millet. Maize Cow pea. Okra. Capsicum. tomatoes. Leaves of Bombax for making soup. "Alligator pepper" imported from high forest area. Potash imported from far north, mixed with tobacco powder and put under lips, as snuff.

Dried Albizia roots, chewed to clean teeth.

Beyond here a few Borassus. Fruit eaten by children.

Plain becomes brushy with scattered trees, little grass – from over grazing.

Change to open scrub forest

Mongu Forest Reserve.

Open forest. trees irregular in height, up to 10 m. or
photo more, very gnarled and twisted. 3-5 m. apart.

Vitex. Eugenia. [illegible]
(photo). Tamarindus indicus,
(indigenous) Carapa ?? (common ~~[illegible]~~)
Terminalia avicennioides,
Randia Bridelia, Canthium,
Daniellia oliverii,
Ficus Parkia, Combretum, Gardenia,
Bauhinia Anogeissus, Acacia seberiana, Acacia sp.
Erythrina, Sarcocephalus, Randia.

A semi-deciduous broad sclerophyll open forest. Burned lightly annually. Trees lose leaves but survive.

Loranthus common (at least 2 spp.)

Ground cover is a thin steppe-like grass. Curculigo common. Many other herbs. Elephantopus cf. mollis.

Shrubs are as common as trees or more so, no sharp distinction.

In places this grades to savanna

On the other side of the road is the same sort of land, unprotected and it is a typical savanna. The larger trees are similar to those in the reserve, and about the same distribution. The smaller ones and shrubs are lacking. Pennisetum and other grasses are dominant between the trees. Much of it is cultivated.

The reserve has been protected at most 10-12 years. Lightly burned for protection, in Nov. or early December.

Where the boundary is not a road a strip is cleared about 15' wide as protection, grass is removed.

On one side of this strip is open savanna, on the other an open scrub forest. The difference is striking.

The savanna has trees to 15 m tall, few small ones. Grass up to 1 m.
The trees are protected species Parkia, Vitex, Daniellia, Tamarindus

at Mongu are crows with white breast and nape, ~~[illegible]~~ vultures seen, also. Small numbers of each, compared with a similar tropical American or south Asiatic village.

In village are a few trees, but rather few. Ficus sp. Elaeophorbia, Eucalyptus, Gmelina, Chlorophora.

(Morita) Open savanna west of Mongu, with cattle

Farther west a flat topped hill, capped by a laterite crust, rim-rock on side. almost bare on top, except for thin grass, and locally a low scrub of Lecaniodiscus and Diospyros mespiliformis, 0.5-1 m. high. Crust at least 1 m. thick, hard. Fragments down the slope. The hill very badly overgrazed. Soil and rock showing through the thin grass.

Rocky hills farther west

Mixture of grass and shrubs. Adenodolichos sp. is common. Diospyros mespiliformis, Lannea, a cereoid Euphorbia, a tall Setaria-like grass, an Andropogon. Many other shrubs. A conspicuous apocynaceous vine with white flowers. Podagric habit not so marked here, but some species have it. No bamboo. Butyrospermum – from which butter is made. Phoenix is common locally, in small clumps, slender trunk red spathe about 25 cm. long <1 cm. w. A wild Musa, rare, with it

photos

photos

At west base a great stand of Euphorbia. Formerly a farm, but little more than bare rock. This Euphorbia is used for boundary hedges.

photos

c 3 mi s. of Jos small villages of conical-cylindric houses dot the landscape. The vertical mud walls, in addition to having thatched roofs are protected by grass hanging vertically from a rope stretched around the house.

photos

In the fields around these houses the principal crop is a Digitaria. Sesame, roselle, pearl millet and sorghum are also grown. The seeds of the roselle are made into cakes.

~~Small~~ medium sized white herons associate with the cattle in small flocks.

Area south of Bukuru with conspicuous close-set Euphorbia hedges dominating landscape on rather rough ground.

Some areas planted to a tall Tephrosia (2 m) with large purple flowers.

Granite hills have an abundance of the white cylindric Euphorbia 1-1.5 m tall.

Nov. 4 Naraguta
just beyond, on a
rocky hill is a
stand of bamboo,
photos partly fruiting.
Culms closely clumped,
clumps small

label written Nov. 4 – Naraguta, just north
of Jos

40739 (bamboo) Oxytenanthera abyssinica (A. Rich.) Munro
1 common on rocky slope in
loose thicket

Nov. 4 – on Plateau, 2 3 mi.
south of Jos
in cultivated fields

1 40 Diotis
common

1 41 Borreria
common

1 42 Digitaria
abundant, planted

2 43 Hedyotis
very common

Nov. 4 Mongu Forest Reserve
35 mi. s.s.e. of Jos
x in open broad sclerophyll scrub forest

1 44 (~~[illegible]~~) Faroa pusilla Bak.
common

1 45 Randia
occasional

1 46 Hedyotis
rare

---

to McClure small, dense clump of arching
solid canes 4 m. tall, to
2-2.5 cm. thick. Fruiting clump
dying. Leaves and sheaths from another clump.

erect; flowers white

erect;
flowers white.

seeds used for food.

erect; flowers white.

flowers white

shrub 2 m. tall; flowers
white.

erect

407 47 (Col.)
1 common

Nov. 4 - 25 km. s. of Jos
1 48 Borreria verticillata L.
very common in eroded
overgrazed ground

Hill Station south of
Jos.
Many dozens of vultures
in sky this afternoon
Nov. 5 - same.
This vulture is sooty brown
has feathers on back of neck
and top of head, front of
neck and head bare, a dirty
grayish.
Chameleon, very slow
moving in Callitris tree.
Saw a bustard on rocky hill.
Tried to get away by creeping
through brush, only flew when
followed.
Photos of Euphorbia, Aloe,
bamboo, Adansonia, etc.
In this grassy-brushy
vegetation between boulders
and outcrops many of
the grasses and annual herbs
are past flowering, but
a considerable number
of Compositae, Leguminosae,
Acanthaceae, Andropogoneae,

erect, bracts purplish
white,

branched herb or suffrutescent
herb, flowers white.

and some other plants
are flowering.
Two (?) species of Asparagus
here. Lantana camara
var. aculeata.
The rock is a very
coarse grained granite.

Nov. 5 - Hill Station, just south of Jos

40749 Hedyotis
occasional in thin soil on granite hill

Nov. 5 - flight Jos - Kaduna in beaver 1 motor plane.

9.24 Jos Plateau - a deposit of reddish material between knobby granite outcrops
Hedges common in places surrounding fields.
Many serious erosion scars and gully systems
Largely cultivated
Irregular plateau with scattered granite outcrops, some perhaps a bit gneissic, with joint systems running north and south.
Vegetation of flat, part grass and cultivation practically no trees or shrubs except on granite.

9.36 Country lower and rougher, trees common, scattered.
most of land cultivated except where too rocky
In distance to right a series of abrupt buttes that

erect.

may be old lava plugs.
A large volcanic(?) mt. to left, plus several small plugs.

9.37 Country smoothes out* at a lower level - savanna, partly cultivated. The uncultivated parts badly overgrazed, reddish and bushy; some of it an open scrub, some a shrub savanna. Serious gully

[illegible] patterns
- Meandering streams in rather narrow bottom lands

9.38 On left a clump of knobby hills, adjoining a rather smooth dome beneath

9.39 Less cultivation, mostly open savanna, some areas grass without trees.

9.40 On right middle distance a roughly circular rough mass of hills forming 2 or 3 more or less concentric circles, not at all regular and with many small bumps or plugs. Some fairly good cones. Possibly an old caldera, but not well marked.

9:42 Large rolling plain along a meandering river with dendritic tributary systems entering at right angles. Narrow gallery forest along river and tributaries. Vegetation between varies from open scrub and open scrub forest to shrub savanna or savanna. No cultivation here at all. River roughly follows course, to right. very muddy

photo This mosaic continues

Road follows course considerably to left.

9:48 Low granite outcrops, rather smooth, terrain rolling. River swings off to right

Vegetation mosaic continues the same, but scattered cultivation appears.

9:51 A cluster of low smooth granite domes in middle distance to left.

More cultivation, savanna gets thinner, more shrubby, no more open forest.

9:52 Granite dome ~~—~~ continues

9:54 to left. Some on right.

9:55 A stream system with broad green grassy bottom land.

Some burned patches in savanna and

9:56 Open forest. Mosaic of open forest, open scrub, savanna and cultivation

9:57 Considerable burning. Same mosaic.

9:59 Approaching Kaduna. Large river makes a bend around the town.

Immediate vicinity of Kaduna largely cultivated but this does not extend more than a mile or two. Spots of savanna and of low open scrub.

Country quite flat for a good distance. Good shrub savanna near airstrip.

10:04 Landed.

Nov. 5 - Kaduna
Cultivated & planted species seen
Dodonaea viscosa (hedges)
Bougainvillea spectabilis?
Plumeria rubra
Mangifera indica
Carica papaya
Catharanthus roseus
Alternanthera versicolor
Thevetia peruviana (hedges)
Canna (hybrids)
Citrus (orange, limes, lemon)
Albizia lebbek? and another sp.
Spathodea campanulata
Cassia siamea
Tamarindus indicus
Borassus aethiopum
Delonix regia
Xanthosoma sagittifolia
Ficus (like F. polita)
Psidium guajava
Phoenix dactylifera
Casuarina equisetifolia
Ficus sp.
Citrus sinensis
Zinnia elegans
Plumbago auriculata
Breynia nivosa
Jasminum pubescens
Allamanda cathartica
Nerium sp.
Tecoma stans
Delonix regia
Jacaranda

Weeds seen
Tridax procumbens
Desmodium triflorum
Ageratum conyzoides
Synedrella nodiflora
Pennisetum (small)
Borreria (same as 10748)
Amaranthus spinosus
Sida acuta
Chloris inflata
Eragrostis amabilis
Solanum verbascifolium

Caesalpinia pulcherrima
Callitris sp.
Hibiscus (hybrid)
Lagerstroemia indica
Tagetes sp.
Eucalyptus camaldulensis
Azadirachta indica
Aster aff. novibelgii
Gaillardia
Salvia
Samanea

Nov. 5 - Kaduna
near airport

Flat land soil generally gray-brown with abundant buckshot concretions covered by vegetation varying from open scrub with closed grass to shrub savanna, bushes broad sclerophyll 1-2 m. tall, grass 1-2 m. Grasses mainly Andropogoneae, mostly in fruit. Most of the shrubs not flowering, or fruiting, except for the abundant Adenodolichos which is flowering abundantly. Among shrubs are an aculeate Randia, several legumes, Bauhinia, Gardenia, etc.

Several knoll-like or low mesa-like eminences, 3-4 m. above general ground level are of a red soil, filled with quartzite fragments and iron concretions. These are capped, irregularly, with a brown lateritic cuirass. Where the cuirass forms the surface there is either no vegetation or a steppe-like grass about 1 m. high or more, with scattered shrubs.

Where it is buried or not evident there is an open scrub about 2 m tall, ranging to closed, broad sclerophyll. Series of 6x6 photos of this whole complex, ending with one of a borrow pit in the red soil and one of the cuirass on top of knoll, one N.E. from top of knoll showing shrub savanna, and one S.E. from same spot showing semi-cultivated savanna landscape.

On formerly cultivated ground near airstrip is a tall grassland of Pennisetum setosum or polystachyon 1 m + tall, some Andropogon sp. about the same stature, with occasional tufts of another Andropogon about 2-2.5 m tall. (photos)

On other side of strip is an expanse of broad sclerophyll shrub savanna about 2 m. tall, grass 1-2 m. These shrubs have many of them, been cut at some time, giving a coppiced effect. There are a number of species of broad-leafed shrubs, no microphyllous ones. An Adansonia-like small tree with large leaves and petiole 2-3 dm. long. (several photos) most of the grasses are Andropogoneae. Some herbs such as Acanthaceae, legumes, etc.

The airstrip is dirt with a laterite surface. Laterite used on roads also, where not asphalt.

Shrub tree with heavy nerved leaves – dipterocarp? Monotes kerstingii

Kaduna river – now very low, muddy. In rainy season rises about 4-5 m. (acc. high water mark on bridge) floods lowlands along river. No houses in lowland but many cultivated patches manioc, sorghum. Tall grass is cut and tied into mats. Sorghum is 3-5 m. tall.

Dominant tree generally is mango. Along river are some others. Several medium sized Ceiba

Spondias? along road leading to ~~[illegible]~~ bridge. or Khaya

2 bridges, one on the highway. Concrete piers.

Some bananas along river.

Series of photos from bridge

Meadows of tall grass Andropogon? sp. in moist ground reaches 2 m. or more. Sugar plantation.

A few ficus loaded with fruit.

"Mahogany" looks like Spondias but may be Khaya.

Psidium guajava. Parkia (seeds ~~[illegible]~~ rotted, then cooked and dried twice, then ground and used to add to soup "to make it sweet") "Okume" seed used for oil, rotted, pounded, oil used medicinally for boils (Idoma language, Benue Prov. and ~~[illegible]~~ Igala ~~language~~ Prov.)

In river bed are great exposures of rock, mud, sand. Rocks apparently strike across river, dip upstream. Gneiss? or granite? bedding indistinct. Lower banks are silt, are planted to Cassava.

rocky stretch rather extensive, above bridge.

Sesbania sp. a shrub 2 m tall is common on the river banks.

The above trees and a great many mango trees are scattered over the flood plain and adjacent low ground.

Nov. 6 – Trip by auto
some exposures of laterite just out of town, on slightly high ground.
Where not cultivated an open broad sclerophyll scrub (from firewood cutting).
Gmelina lines road.
On cult. land scattered fair sized trees.

West Kaduna

Not far west and south is a vegetation varying between open forest and savann. some trees up to 10 m. tall, mostly much less. Broad sclerophyll. rather thin grass 1-2 m. tall. Soil silty, hard. Terrain very flat. Considerable coppice shrubs from firewood cutting. A few thorny Acacias. Considerable variation in shrub composition. Larger trees are Tamarindus, Khaya sp., Erythrina, etc. Tamarindus "samia" used to make a drink for coughs. Twigs chewed.

[illegible]

"ago"

Grass is rather sparse mostly 2-3 sp. Andropogon and a Ctenium. The spike

of Ctenium curl in spiral fashion.
This land is under Native Administration. Must have permission to cut firewood. Apparently the Khaya trees are left, and some others.
Fire-road is cut and cleared.

Tree with long, alternate lvs. no stipules, axillary 3-celled fruits, suspended ovules, 3 separate branched stigmas.
fruit eaten, leaves used to protect ~~[illegible]~~ cola nuts from sun. water from leaves used for soap. wood burned, ashes leached to make soap "apo" (Igala pro. language)

Palm wine made here, carried in to town in gourds, from [illegible] groves 6 mi. west of Kaduna.

Large trees (Khaya) are very crooked. Perhaps one straight log in trunk, if any, 3 dm. dbh.

Grasses are flowering or fruiting, almost everything else, except a few legumes, is dry.

Market - Kaduna.
Mats of several styles of platting of palm (?) lvs. also seen mats of grass stems.
Okra (dried), chili pepper, maize, sorghum, orange, lime, millet, peanuts, cotton, rice in hulls (long grain) Taro. cassava.

East of Kaduna.
Much cultivation - sweet potatoes, sorghum, beans.

Small mesas capped with laterite. Rim rock. Scattered trees.

photo

Broad valley, central part a shallow trough ~~a~~ cut into a concretion-filled hard soil, with narrow ravines cut in it. apparently an incipient locally well formed laterite crust. Broad sclerophyll shrub savanna. grass 1-1½ m. tall. Pterocarpus is abundant.

A few vultures seen around Kaduna. White herons, usually with cattle.

North of Kaduna is a long low strike ridge of fine grained granite gneiss. This is perhaps 15 m. high. rounded. Used as back for target range by army.

photo

Vegetation mostly grass, 1 m., rarely 2 m. tall, some other herbs, now all very dry, in longitudinal depressions with dark gray soil 1-3 dm. deep. On very shallow spots, Bulbostylis. very small. Completely dry now.
A very few trees with roots clinging to rocks and entering crevices.

Cattle graze in savanna, owned by Fulani: a nomadic people who have no fixed base but who wander over the whole northern Nigeria grazing their cattle on public lands, selling milk, with their belongings strapped on backs of cows, putting up temporary huts at times.

1959 Nigeria

Nov. 6 – east of Kaduna
in open scrub and
thin ~~scrub~~ grass

40750 (diff. ?) Monotes kerstingii
7 most abundant shrub

3 51 Hedyotis
common in cultivated
field

Nov. 6 – west of Kaduna
2 52 (diff. ?) Monotes kerstingii
occasional in open
scrub forest

It seems clear that the difference between of scrub and open scrub forest in this area is one of human activity. The vegetation will grow to tree size if the plants are not cut for firewood. Thus there is scrub or shrub savanna in the vicinity of villages on most uncultivated land. In the cultivated land and uncultivated, certain trees reach quite a reasonable size because they are protected or at least not

615 m. (alt)

shrub 1.5 m. tall,
flowers whitish, fruiting
calyx pinkish.
flowers white, corolla
funnelform.

600 m (alt)

shrub 2 m. tall.

cut. Thus the cultivated areas are essentially savanna. The uncultivated areas are either open scrub with scattered trees, or savanna with scattered shrubs and trees. In some areas all trees have been cut, leaving either, cultivated fields, or open scrub or shrub savanna patches.

The two most generally seen trees in the vicinity of towns are mango and "mahogany" which maybe Khaya.

Nov-6 – air trip Kaduna-Kano
Heron plane rt. side.

5:12 Left ground.
Considerable cultivation.
A great part of the country has been recently burned.
Small watercourses with strips of green cultivation along them.

5:16 Serious erosion scars.
Then a mosaic of savanna and open forest.
Trees much larger near small streams.

5:18 Scattered cultivation.

5:19 A small marsh with a pond in center.
Easily a third of land cultivated. Many patches have been cultivated but are fallow now.

5:21 Streams with grassy bottom lands, water.

5:22 Serious gully erosion

5:23 Mosaic of large areas of cultivated patches and large savanna areas.

5:24 More dendritic gully system.

5:25 A meandering river with oxbows at least 3 times the width of the present somewhat incised channel.
Then savanna with

some fairly large cultivated areas.
A dirty haze or dust storm makes visibility rather poor.

5:27 Crossed a surfaced road at right angles.
Considerable cultivation some shrub savanna.
a few scattered trees in both savanna and cultivation.

5:29 Generally a mosaic of perhaps one fourth cultivation and three fourths savanna.

5:30 More cultivation as we go north.

5:32 Strips of gallery forest.
Then a meandering river with gallery forest along its affluents.
Then a mixture of open forest in patches.

5:33 Cultivation predominant.
Soil pale grayish ~~tan~~ buff
Trees become fairly abundant and large in the cultivated land.
Probably because they are not burned.

5:36 Still mostly cultivated
Crossed an important road at about 45° from course to right.

5:37 Then patches of open forest, trees fairly large with cultivated and abandoned patches.

Visibility not at all good.

5:38 Country mostly cultivated, the uncultivated areas look overgrazed.

5:39 Following railroad. Open forest on west side, mostly cultivated on east. Appear to be flat rock exposures, but this not certain.

5:41 Some overgrazed savanna, some cultivation

5:43 Many small rock exposures. Much cultivation. Small dry stream beds.

5:44 Larger rock exposures. Following a narrow river with braided sandy bed rather straight.

5:45 Fields separated by hedges.

5:46 Almost solid cultivation except a few rock exposures and some badly eroded patches.

5:47 River turns sharply to right. Almost dry. Cultivation predominant. Patches largely marked by hedges. Many scattered trees.

5:49 Cultivation becomes less distinct, much of it appears to be abandoned and grazed. Irregular cattle trails.

5:50 Ravines with scrub. Cultivation pattern but few patches active mostly grazed. Many trees, so the land is essentially a savanna.

5:52 Crossed a broad sandy river with little water. Patches separated by hedges but rather few of them cultivated mostly grazed. Fewer trees but still an open savanna landscape.

5:58 Landing. Hedges very prominent, around fields and around dwellings. Planting in rows. Mostly sorghum or maize.

No. 7 - Kano

cultivated or planted plants ex,

Azadirachta indica

Delonix regia

Thevetia peruviana (hedge)

Tagetes sp.

Jatropha gossypifolia

Tropaeolum majus

Alternanthera versicolor

Portulaca grandiflora

Bougainvillea spectabilis

Caesalpinia pulcherrima

Dodonaea viscosa (hedge)

Albizia lebbek

Khaya ?
Manihot
Sorghum
Mangifera indica
Hibiscus (hybrid)
Ficus? sp
Plumeria rubra
Nerium sp.
Zinnia elegans
Gomphrena globosa
Adansonia digitata
Tamarindus indicus
Borassus aethiopum
Canna (hybrid)
Rosa sp.
Duranta repens
Punica granatum
Zizyphus sp. (spineless, lvs. glabrous)
Apoc. with thick stems,
alternate lvs. bright rose
pink campanulate salverform
fls. spatulate deciduous
lvs. (photo) fls. puberulent.
Ficus religiosa vel. aff.
Phoenix dactylifera ?
Lantana camara v. aculeata
Cosmos sulphureus
Coleus scutellarioides
Catharanthus roseus
Nerium indicum
Euphorbia pulcherrima
Zebrina pendula
Tecoma stans
Caladium bicolor
Ageratum houstonianum

---

weeds
Cynodon dactylon
Tridax procumbens
Chloris inflata
Euphorbia hirta
Boerhavia diffusa
Synedrella nodiflora
Eragrostis amabilis
Eragrostis ciliaris
Dactyloctenium aegyptium
Amaranthus spinosus

Nephrolepis sp.
Codiaeum variegatum
Kalanchoe pinnata
Solanum lycopersicum
Daucus carota
Beta vulgaris
Lactuca sativa
Citrus sinensis
Cassia siamea
Acacia catechu ? globular heads, tomentose sub-moniliform pods
Albizzia sp.
Gaillardia sp.
Eucalyptus sp.
Quisqualis indica
Parkinsonia aculeata
Pelargonium zonale
Nephrolepis duffii
Gynandropsis gynandra ?
Ilex microphylla
Salvia coccinea
Celosia argentea
Lagerstroemia indica
Caesalpinia pulcherrima (red & yellow forms)

The principal street trees are Azadirachta indica, 2 species of Ficus, 40753, 2 species (at least) of Albizia, Mangifera indica, and Khaya(?). Delonix is common, also, and Cassia siamea.

Some vultures, but not many; 6 together seen sitting on a roof.

Nov. 7 - Kano

40753 (leg.)
1 common street tree
1 54 Hedyotis corymbosa
rare in park
1 55
rare in park
1 56 Borreria
occasional in waste places
1 57
abundant on dry lateritic mesa
1 58
common on slopes of dry lateritic mesa

'84 m (map)
tree 8 m. tall, pods pendant.

erect.
erect

erect, flowers white.

520 m. shrub 1 m. tall, branched.
↓

much branched shrub 1 m. tall.

Nov 7 - auto trip -
Cassava patches near airport. Eroded places show a laterite layer about 0.5 m. below surface of rather fine brown soil.
Roads lined with trees, mostly azedirachta. some Khaya (?)
~~&~~ Scattered trees of Parkia, Prosopis?
Soil pits show a reddish brown soil gradually more yellow downward, no ironstone. (north of city).
Plantation of coppiced albizzia about 5 m. tall. Plantation, also, of Cassia siamea and of 40753.
Huge baobab tree (photos)
Emex spinosus common in weedy places.
Great mud wall around old city and a large area of fields. Belt of planted coppice outside wall. Sorghum fields outside this, with scattered Parkia & Prosopis perhaps 8 m. tall, spreading crowns. Occasional Phoenix dactylifera.
Moat between wall and coppice. Ipomoea aquatica

Scattered baobab and ~~a few~~ other trees inside wall. Area inside partly cultivated in sorghum, partly covered by a dense scrub of Lawsonia inermis 1.5-2.5 m. high.
Mud wall thick at base ~~&~~ tapered to top, 4-5 m. high.

Inside wall are two flat topped hills, or mesas, 10-15 m. high, capped with ironstone (sample), inside, where exposed, a pale buff soft weathered rock. Steep sides scrub-covered, some scrub on rim-rock. photo.
Grass with scattered shrubs on top. (photos) (photos from top, of Kano and of plain.)
Many grasses on top, gray shrub (40757). Waltheria indica, several legumes, Heteropogon contortus on lower slopes.

Phoenix dactylifera common in old mud city

Moringa oleifera in town
A few doum palms, branched.

1959 Nigeria

A few outcrops of granite, some flat, smooth, exfoliating, at ground level, one low smooth dome, and several pointed and bouldery. Little vegetation on the smooth ones, irregular scrub on the bouldery ones. These are being used up as building stone and road metal.

The old town is a sprawling but crowded aggregation of mud huts, mostly built in Arabic style, with rounded roofs and vertical ear-like pinnacles decorating sides and corners on top of the walls. There are almost no trees, except for a scattering of date palms, and the general impression is hot and dusty.
The market is like a series of cliff dwellings, with massive mud walls and numerous doors.

The whole old city is inside the great wall, and, sprawling as it is, it occupies only a small portion of the enormous area surrounded by the wall. There are extensive fields, several ponds, the two hills, the westernmost one of them with the city's water reservoir on its top. Much sorghum, "Guinea corn" cultivated. Some areas of closed or open Lawsonia scrub.

The general area is a vast plain, mostly cultivated, sorghum and Cassava, with scattered large trees, few small ones. It is savanna, but the herbaceous vegetation is cultivated. The Guinea corn, which occupies much of the area, is about 3-4 m. tall, or even 5 m. rarely.
The soil is fine and heavy, laterized and with a crust locally, especially on high spots.

1959 Spain

Nov. 8 - Barcelona

Principal street tree seems to be Platanus (hybrid).

In Plaza Cataluña the tree is a Quercus, similar to Q. virginiana, with elliptic acorns 3-3.5 cm. long with a small, closely scaled cup less than 1 cm deep.
Lvs. dark green above, white tomentose beneath.

In front of cathedral -
Casuarina equisetifolia
Cupressus sempervirens
Quercus sp.
a legume like Robinia but
spineless and smoother bark.

Inside cathedral enclosure
Phoenix canariensis
Magnolia grandiflora
Livistona chinensis

In Parque de la Ciudadela
Aesculus pavia
Tilia cordifolia
Phoenix canariensis
Chamaerops humilis
five Dracaena draco
Magnolia grandiflora
Erythea armata
Washingtonia filifera
Phoenix dactylifera
Ligustrum (evergreen)

Jasminum sp.
Pinus
Casuarina equisetifolia
Cedrus deodara
Cedrus atlantica
Schinus molle
Cupressus sp. cf macrocarpa.
Ficus sp.
Robinia pseudo-acacia? spineless
Populus alba? weeping form
Ulmus sp.
Laurus nobilis
spreading tree with
strongly trinerved leave like
Cinnamomum but odorless.
Platanus (hybrid)
Celtis sp.
several other unidentified
trees and many shrubs.

On street leading to airport
Salix cf. babylonica
Platanus (hybrid)

Leaves are partly shed - Aesculus, Tilia are almost bare, Platanus varies from leafy to partly bare. Salix still has leaves.

Nov. 8 – flight from
Barcelona to Paris. –
Viscount, left side 15,000'
Weather nearly clear
but quite hazy.
Along sea by airport is
a belt of small compact
green flat-crowned trees,
appearing quite trimmed.
These are only in the
vicinity of the airport.
3:35 Between airport and city
cultivation comes to
the top of the beach.
Clouds.
3:40 Hills with thin maquis
cultivated fields in
flatter ground. Many
villages and towns.
3:43 Some patches of forest
probably planted. In rather
rough ground running
up toward mountains.
Pyrenees in distance
ahead, some snow
on higher peaks.
3:45 Great escarpments
and terraces on several
levels, apparently flat
white sediment dry beds.
cut by deep canyons.
Mostly thinly wooded
some pastures, some
cliffs bare, rocky slopes

partly bare. The woods
may be partly a thick
scrub. Mostly dark
green, occasional bright
yellow trees.
3:50 Dissection more marked, steeper
south slopes bare.
Some terracing, but mostly
rather uninhabited country.
3:51 Crossed a winding road.
3:52 A valley, rather rugged, with
a town and some villages.
Some brown deciduous forest
on slopes.
3:53 Spectacular ridges
and valleys, trending
east and west. Valleys
flat bottomed, ridges
terminating in a large
valley along course.
Valley bottoms thickly
populated, ~~[illegible]~~ ridges
partly wooded, partly bare.
Pyrenees close by on left.
Upper ridges snow covered.
Upper slopes brown, grassy.
Some traces of forest
or scrub in ravines
and on steepest slopes.
3:56 Along course some very
rocky sparsely vegetated
ridges and slopes.
3:58 ~~B~~ East end of Pyrenees –
some forest on lowest steep

Spain

slopes. Upper slopes
have some thin scrub.
mostly dry grass.
a few buildings high
4:00 on slopes. Lower slopes
a patchwork of cultivation,
forest, scrub, pasture.
Occasional tiny villages.
4:02 Flat valley with a
town, cultivated, with
hedges. Slopes partly
wooded, partly dry grass.
4:03 Slopes become gentler, drier,
mostly dry grass or stubble
fields. Some eroded ground.
Some steeper slopes very
rocky, thin scrub with
rock showing through.
Then, densely wooded
or bushy slopes. some still
very rocky.
4:07 Strike ridges crossing
course, of strikingly bedded
rock, dip slopes bushy.
Country generally
rough, rocky and
bushy to thinly wooded.
4:09 Less relief, land mostly
cultivated. Scattered
villages.
4:11 crossed a river. Several
Towns, relatively gentle
Terrain.
4:12 Terrain becomes rougher,

some of it eroded.
steeper slopes and ridges
thinly wooded or bushy.
4:14 Series of high steep ridges
about east-west. Wooded
except lower slopes, which
are cultivated or grazed
4:16 Becomes very rough.
Precipitous slopes, with
very little vegetation
Visibility very poor.
Higher and less precipitous
slopes wooded. Practically
no flat ground.
4:20 Some flatter land, but
visibility very poor.
4:20-30 Country mountainous
but so hazy as to obscure
all detail.
4:32 Over a vast sea of clouds
The upper surface billowy,
appearing like gigantic
ocean swells.
These become more irregular
northward.
4:35 A few peaks above clouds far
to left.
4:36 Swells end. Relief of top
surface of clouds is now
rather minute. Still
like irregular swells
but on less than a tenth
the scale.
4:38 Shifted course slightly to east

11.13 Still over clouds. Another group of peaks far to left. Now there seems to be a haze layer above the clouds to northward

Nov. 10 - flight, Paris - London. The woodlots and forests in France and England still have their leaves. Those in France are quite yellow or yellow-brown, in England yellowish green to dull yellow. The fields are brownish green in France, rather green in England.

1959 California

Nov. 21 – trip by auto Berkeley to Laytonville Mendocino Co. along East Bay Freeway, San Rafael Bridge and rt. 101.

Baccharis pilularis in Berkeley Hills in fruit. Some patches of Artemisia californica. Photinia with fruit

San Rafael hills, w. end of bridge – mosaic of open to closed evergreen oak forest (a scrub forest), dry grassland, patches of scrub of Baccharis pilularis, some patches of Artemisia californica, chaparral.

Farther inland the open forest grades to savanna, some trees are deciduous, mostly broad sclerophyll.

In flats the oaks in the savannas are quite large. On the hills the mosaic is open evergreen broad sclerophyll forest – savanna – seasonal short grass. Very little scrub.

Near Novato the trees are locally predominantly deciduous rather yellow now. Salix abundant along watercourses.

Marin Co. – Sonoma Co.

Some apparently seasonal marshland on flat ground. Northward the proportion of deciduous trees become ~~more~~ greater.

The lower hills east of road mostly grass and savanna, higher ones west of road semi-deciduous open to closed forest.

Santa Rosa area – hills a mosaic of dry grass small patches of closed evergreen and closed deciduous forest, some open forest and some savanna.

Orchards in flat ground. Some open fields. Scattered large oaks.

Hills in distance to west from Windsor seem to have conifers prominent in forest cover on ridges.

Areas of oak savanna on flat ground. In east in distance the abrupt Mt. St. Helena, wooded but in places thinly so.

Lower hills partly wooded, especially ravines, some savanna.

Healdsburg – Vineyards and orchards on flat land.

1951 California - Sonoma Co.

Russian River has some water, not much. Wooded hill to east has a few conifers in evergreen oak forest. Conifers abundant on low hills to west.

North of Healdsburg is a high range - the lower slopes with a mosaic of wooded ravines, patches of wood, grassy slopes, savanna, etc. The upper ridges and peaks are chaparral-covered. The lower wooded slopes are largely deciduous the ravines evergreen. To west the hills are covered by redwood. Orchards and vineyards in valley bottoms and lowest slopes. Some olives, oranges.

A few digger pines locally on low hills north of Geyserville. Mostly patches of oaks.

Some olive groves south of Cloverdale. Hills with open forest, mixed deciduous and evergreen oaks, patches of redwood on hills west of road. Higher hills to east covered by chaparral. Lower with

Mendocino Co.

closed to open forest.

Hills north of Cloverdale have open to closed mixed forest of digger pine, evergreen and deciduous oaks, patches of chaparral. Some scattered redwoods and patches of redwood, especially in ravines. Deciduous oaks commoner on west, east and south slopes. Some patches of grass and savanna on west and south slopes.

Deciduous oaks (Q. douglasii?) are a fine red-orange to burnt orange to greenish brown.) Grass patches very heavily grazed. Some Photinia and Arbutus. Some patches of what appears to be Artemisia californica on steep south slopes. Acer macrophyllum bright yellow in canyon along Russian River, also Populus fremontii?

or Ceanothus?

Usnea begins to show up on trees.

Mts. to west densely covered with chaparral and some forest. Northward a fine mosaic of savanna, open and closed mostly ~~[illegible]~~

1957 California Mendocino Co

deciduous forest, chaparral. grass very heavily grazed. Upper slopes and ridges tend to be predominantly chaparral.

On range east of Ukiah forest is thin, no redwood. On that to west there are patches of redwood, generally thicker forest. Considerable areas of chaparral on high ridges and steep slopes of both, in some parts predominant generally, as immediately west of Ukiah.

North of Ukiah on low hills the forest becomes dense and quite mixed. Some open areas, grass or savanna. To north and higher, mostly savanna. Higher hls more forest then chaparral. Distribution of patches of conifer forest very irregular — probably remnants from logging.

North, toward Willits much conifer timber, mainly Pseudotsuga. Lower down mainly deciduous oaks, much Rhododendron. Some Pinus ponderosa.

North of Willits an irregular mixture of deciduous oaks and conifers.

Bad burns several miles north.

Some fairly big conifer forest. Patches of Arbutus. Arbutus in fruit. Cornus nuttallii turned reddish. Yellow Salix in creek beds. Oaks are brown ~~but~~ have not lost many leaves.

Country gets quite rough near Longvale. Predominantly coniferous forest, some deciduous oaks. There has been logging in many areas here and the forest is rather ragged.

Becomes very brushy open forest, some conifers.

Laytonville is in a flat valley. Deciduous trees and open fields in bottom. Coniferous forest, and deciduous oak on sides.

Nov. North Coast Range Preserve

Lower slopes and ravines densely wooded with Douglas Fir. Some redwoods in Skunk Creek and Eel River but none in Elder Creek.

Upper slopes covered by a thick chaparral of Ceanothus, Arctostaphylos, Quercus vacciniifolia, Arbutus, etc. The broad sclerophyll is of forest size in the ravines and lower slopes, but is shaded out by the Pseudotsuga.

Chinquapin Point
large Douglas firs,
large Castanopsis semperv.
large Lithocarpus densiflorus
much Chimaphila umbellata
Douglas fir reproduction in semi-open.

Driftwood "Meadows"
A patch of glaucous Arctostaphylos on a
1-1½ m. flat ridge top, with some bare spaces, a few dwarfed Castanopsis. No herbaceous growth at all. Surrounded by rather small Castanopsis of varying height

a few scattered Douglas fir. No reproduction.
Ridge top forest on this side is Castanopsis ~~[illegible]~~-Lithocarpus small trees, crowded perhaps 5-8 m. tall. a little Arctostaphylos.
Lower down a ~~[illegible]~~ remarkable forest of Lithocarpus perhaps 3 dm ~~[illegible]~~ dbh, 15-20 m. tall. No Douglas Fir reproduction.
Lower a mixture of Arbutus and Lithocarpus, small forest. 10-12 m. tall. Then almost pure stand of Arbutus.
Serious logging in 1950 on after, in Misery creek drainage on BLM land - timber theft
Some seedling Douglas fir on scars. Bad erosion in canyon bottom.

There is a road cut in the slopes along the ridge south of Elder Creek, mostly on the Elder Creek side just below the crest, and down into Misery Creek. The lower end, in Misery Creek is badly eroded. One or two other spots on the steeper slopes are also giving trouble.

Nov. 27 - Coast near Westport southward

Coastal bluffs grassy or brushy grazed by sheep. Redwood forest immediately back of coast, but not on exposed parts. In canyon bottoms alder thickets and forest.

Nov. 22 - Northern California Coast Range Preserve, north of Branscomb, west of Laytonville, Mendocino Co.

40759 Quercus wislizenii var. frutescens Eng. dominant in scrub forest on high sandstone slopes.

shrub 3 m. tall.

Dec. 12, 1959 – Hogback Mt.

Low forest, principally oak, mostly Quercus rubra, of low trees, 6–10 m. tall, flat topped and with very thick trunks for the size of the trees otherwise.

A thin shrub layer, mostly of Kalmia latifolia, locally of other shrubs.

Ground very rocky with rocks protruding abundantly from ground. Soil thin and usually full of stones. In places a tufted ground layer of Deschampsia.

Lichens abundant on trunks of older trees and on rocks.

Flock of 3 ravens south of here. Herd of 6 deer plus one alone. north of here.

1040 m

collection of lichens (& mosses)

40760 Parmelia
on dead log.

61
62
63
64
65
on tree trunks

66
67
68 Umbilicaria
69
70
71 Umbilicaria
72 (moss)
73 (moss)
on rocks

1959 Virginia

Dec. 17 - Elk Wallow Shelter

Rather thin mixed forest on gentle rocky slope - Quercus alba, Q. prinus, Q. rubra, Carya sp. Acer rubrum, Pinus strobus, Tsuga canadensis, etc.

very little undergrowth.

40774 (lich.)
75 (lich.)
76 ..
77 ..
78 ..
79 ..

on rocks.

80 ~~lichen~~
81 ..
82 ..
83 ..
84 .. Parmelia

on tree trunks

85 moss
86 ..
87 ..
88 ..

on rocks

89 (lichen)
90 (moss)

on base of tree

91 lichen

on tree trunk

92 lichen
93 ..
94 .. on trunk of Acer rubrum

740 m.

Dec. 13 – m. p. 27,
4 mi. s. of Elk Wallow
Colony of Betula papyrifera
in mixed forest on
n. e. slope, at head of
south branch of North
Fork of Thornton R.

Dec. 13 Whiteoak Canyon Trail
Mixed forest of oaks;
red maple, a few pines and
hemlocks, understory 2 m. tall
of Kalmia latifolia.
Mosses and lichens on rocky
ground.

40795 (lichen)
96 "
97 "
98 "

on broken rocks

99 (lichen)
40800 moss
01 "
02 "
03 "

on earth

Dec. 17. Whiteoak Canyon Trail, Limberlost

Forest of young Tsuga, a few old Tsuga, scattered old Quercus alba, some small Betula alleghaniensis

Mosses & lichens on rocks, earth and fallen branches of broad leaf trees.

Almost no lichens on Tsuga, but conspicuous Protococcus?

40804 (lichen)
05 (Protococcus?)
on bark of large Tsuga.
06 Lycopodium obscurum
under Tsuga.
07 moss
08 lichen
09 "
10 "
11 "
on fallen branches of broad-leaf trees

12 (moss)
13 "
14 "
15 (lichen)
16 Cladonia
17 moss
18 lichen

1959 Virginia

403 19 (moss) Bartramia
20 (moss) Thuidium
on earth in small opening
21 (lichen)
22 ..
23 ..
on rock

~~#~~ Dec. 13 Skyline Drive
below Mary's Rock.
24 Cladonia
by small [illegible] seeps
on road cut in rock.

Dec. 20 - 1 mi. n. of Centerville
Fairfax Co.
25 Cladonia
common on ground in
Pinus virginiana forest.
26 Cladonia
same
27 (lich.).
same
28 Cladonia
~~in heavily grazed~~
in open grassland being
invaded by small pines.

1960 Virginia

Jan. 1 - between Gallows Rd. and Pine Springs on Arlington Blvd. Fairfax Co.

Thick Pinus virginiana forest, trees 10-15 m. tall, 1-4 m. apart, 5-20 cm. apart. some Cornus florida of fair size, deciduous saplings.

Count of plants along Odum series:

10 - 7
20 = 9
100 - 19
300
700
1000

Pinus virginiana
acer rubrum
Lonicera japonica
Heterotheca mariana
Chimaphila maculata
Cornus florida
7 [illegible] indet
Mitchella repens
Liriodendron
Liquidambar
Vitis sp.
Sassafras
Smilax sp

Fairfax Co.

Feb 7 - about 2 mi s.e. of Sunset Hills

Rather dissected wooded area perhaps 20 m. relief. mixed oak, tulip, Pinus virginiana + P. rigida nothing over 2 dm. dbh. as the average mostly near 1 smaller. Has been cut but not too recently, strong evidence of fire + charred stumps + bases of trees.

Unusual amount of Ilex opaca in low parts of valleys The understory is actually green. Scattered holly elsewhere.

No great amount of honeysuckle. Some greenbrier.

Some areas with only saplings.

1960 Virginia

Feb. 12 - 4501 Kirby
Fairfax Co.

Somewhat dissected edge of Potomac ravine
Property of M. Leven
17 acres - large house, about 1 acre orchard and 2-3 acres open on one hill, small patches of Pinus virginiana

Opposite hill has 6-8 acre pasture. Ravine between has mixed woods largely mixed conifers, esp. Pinus strobus planted, some tulip poplar, etc. 3 small ponds in bottom of ravine (lower one does not hold water), spring in head of ravine, wild flowers & bulbs planted on terraces around ponds. One solid grove of young pine. Some azaleas planted.

30 years ago the entire area was completely denuded. Many trees planted, but Tulip, Pinus virginiana, oaks etc. have come in.

Some semi-open slopes with andropogon, Lonicera japonica, etc.

Fence across middle, the part on other side is being grazed (incl. the pasture mentioned above)

Pin oak, shingle oak, sweetgum
Tilia, Fagus, brought in. Nyssa.
Cornus florida. Magnolia glauca.
Rhod. viscosum. Clethra alnifolia.
Fraxinus. Tilia cordifolia. Acer nigrum.
The Platanus is native. also a big white oak and a couple of large Acer rubrum. also Juniperus virg.

Betula lenta, Picea abies, Picea sp.
Abies balsamea, Pinus austriaca
Betula nigra, Oxydendrum arboreum
Prunus pennsylvanica, Syringa vulg. Planted.
Soil seems to be a residual soil on rotten gneiss & schist.

Two large old Picea abies by house which are very old.

Saw 2 sundogs at 4:45 p.m. (semi overcast & hazy in west)

1960 Virginia

Feb. 20 - Ball's Bluff
Potomac R. Loudoun Co.

Woods on narrow flood plain and bluffs are fairly old-growth, entirely deciduous. On flat or rolling land back of edge of bluffs most of the woods have been cut over, regrowth of varying age. All deciduous except for ~~a~~ scattered Pinus virginiana right near old cemetery. Some areas very low growth, largely Cornus florida, rather sparse. Scattered Juniperus seedlings scattered in sparser parts of woods on flats. The taller trees on the flats are mostly oaks, some hickory. On bluffs, in ravines and on flood plain Platanus is common, some Celtis.

One pileated woodpecker seen, several heard.

Flock of Canada geese seen flying from open fields toward river, about 150.

Small opossum in open at edge of woods

seemed very sluggish, snarled but did not attempt to leave, mouth dripped a bit. When picked up by tail did not seem much disturbed. When put down ran off to ravine with logs and rocks.

Tree sparrows feeding in pasture. Downy and red-bellied woodpecker in edge of woods.

Gt. Blue heron flying toward river.

Some snow on ground, especially on north-facing slopes, hard smooth crust on surface.

Said to be a fair deer population in the area, increasing. Some stray cattle wander from pasture in woods.

A very thorny Rubus on ravine edges around edges of forest.

960 New York Ulster Co

March 24 – Lake Mohonk

Anticline in quartz conglomerate, with lake in a graben.

Well wooded with a mixture of hemlock, white & pitch pine, paper birch, chestnut oak, Amelanchier, yellow birch red & striped maple etc. with ~~a~~ shrub layer of Kalmia, etc and abundant Vaccinium

Was burned over in the 1860s very thoroughly, then ~~[illegible]~~ largely grew up to chestnut, which was eliminated by blight, when the present composition followed.

Upper parts have dwarfed pitch pine and birch in sparse stand with abundant scrub but much bare rock also.

1960 Virginia

Labels typed

April 2 - Skyline Drive just south of Pocosin Cabin, m.p. 60.

4 829 Hamamelis virginiana
1 common in thickets on flat

April 2 Skyline Drive just north of Baldface Mt. Overlook

1 30 Hamamelis virginiana
common in thin woods on moderate slope

April 2 Swift Run Gap, west slope.
Woods of Fagus, Quercus, Magnolia, Betula etc. in valley along small stream

1 31 ~~Tipularia discolor~~ Aplectrum hyemale
occasional

3 32 Epifagus virginiana
very local, under Fagus grandifolia

April 17 - Hunter Valley, 2½ mi. n. of Oakton (near Hunter Valley Swimming Pool.)
Gentle slope facing north, with ~~[illegible]~~ old field vegetation varying from mixed shrub savanna to ~~open~~ mixed open scrub of young Prunus serotina saplings (2-5 m.), Juniperus virginiana (2-3(4) m.),

Shenandoah National Pk.

shrub 1.5 m. tall, wood greenish yellow.

shrub 2.5 m. tall, wood greenish yellow.

leaves green with strong white nerves, plicate.

some Pinus virginiana (2-4 m.) Acer rubrum (2-4 m.), tangles of Rubus argutus, and closed mixed grass, some Andropogon and Tridens dried from last year

1960 Virginia

April 17 - Small affluent of Difficult Run

White oak, black oak, tulip, in bottom of valley with considerable patches of Kalmia
Lycopodium obscurum + L. complanatum,
some fair sized trees.

Belt of thin scrub pine around north slopes and headwaters.

In this pine belt is an area of some acres in which most of pines have been blown down, toward east, some years back leaving a thicket of saplings, both pine and broad leaf, some Ilex opaca. 4-8 m tall.
A little cutting some years back, judging by a few pine stumps of fair size.
Much Vaccinium in undergrowth, both high + low bush.
Chimaphila maculata
Mitchella common, Pyrola

rotundifolia occasional
Considerable Cornus florida locally
Colony of Chimaphila umbellata.

In upper part of stream valley quite a few pines blown down.

Lycopodium very abundant upstream.

On south side of upper part pine woods are thicker, less undergrowth but some red maple, nyssa, Cornus, etc.

Lower south side is purely deciduous, the boundary between them sharp and almost at right angles to stream.

1960 Virginia

April 17 - Bowman Place,
Snakeden Br.

~~A~~ Young rather thick second growth of oaks, hickories, a few tall Populus + pines ± 20 ± m. tall, up to 10-15 cm dbh.

In shallow valleys patches of Ilex opaca understory 2-4 m. tall, stems up to about 4 cm. thick. In places dense enough to touch, generally not so close. Cornus florida with it.

Some Smilax.

A dry ravine ~~through~~ ~~it~~ originating in patch. Polystichum common on banks.

Ilex thins out headward.

Some Lycopodium complanatum Mitchella Pyrola rotundifolia.

April 23 - Great Falls
(road to quarry)
plants ~~in flo~~ seen
Ranunculus abortivus (fl.)
Hedyotis caerulea (fl.)
Lonicera japonica
Acer rubrum
Taraxacum vulgare (fl)
Antennaria plantaginifolia
Claytonia virginica
Kalmia latifolia
Lycopodium obscurum
Fagus grandifolia
Smilax rotundifolia
Luzula sp. (fl.)
Viola sp. (fl)
Vaccinium atrococcum (fl.)
Amelanchier sp. (fl.)
Saxifraga virginiana (fl)
Hieracium venosum
Cornus florida (b.)
Symplocarpus foetidus
Prunus serotina
Anemonella thalictroides
Quercus alba
(many seedlings, more on roadside than in woods under other side of tree, but here many in relatively open area, very few in thicket)
Vicia sp. (fl)
Polystichum acrostichoides
Smilax glauca
Silene caroliniana (glandular) (fl.)

1960 Virginia

Arabis laev. virg? tenuipes) (fl.)
Podophyllum peltatum ~~(fl.)~~ (b.)
Populus deltoides
Ilex opaca
Rhododendron sp. (b.)
Rhus toxicodendron
Dentaria laciniata (fl)
Cercis canadensis (fl)
Glecoma hederacea (fl)
Pinus virginiana
Parthenocissus quinquefolia
Vaccinium stamineum (b)
Viburnum prunifolium
Vaccinium vacillans
~~fol~~

Leaves of trees from just showing to 1/3 or even half expanded.

April 24 - Sleepy Hollow

5 purple finches, 3 male, 2 female, seen eating grit from sand pile on terrace.

Fairfax Co.

April 24 - north of Centreville

small patch of Pinus virginiana woods.
Trees 1-3 m. apart, up to 15 (20) cm. dbh. 10-12 m. tall.
Thin Lonicera japonica over much of ground.
Considerable Juniperus virginiana up to half the height of the pine.
Shrubs scarce, a few
lc Cornus florida to 1 m. tall,
✓ lc Sassafras to 1.5 m.
very small (c) ✓Ulmus sp.,
✓c Prunus serotina (c) ✓Quercus sp.
✓r Acer rubrum, r ✓Viburnum prunifolium

Herbs & dwarf shrubs:
r-lc Chimaphila maculata
✓ lc Veronica officinalis
✓ c Potentilla (canadensis?)
✓ c Vaccinium vacillans
✓ c Hedyotis caerulea (fl)
✓ c Achillea millefolium
o Daucus carota
c Galium
o Taraxacum vulgare (fl)
✓ r Podophyllum peltatum
la Rosa carolina
✓ r Smilax glauca
Oxalis sp.
o Antennaria
✓ c Antennaria plantaginifolia

1960 Virginia

✓(la) Allium vineale
^ Asplenium platyneuron
✓ o Rhus toxicodendron
✓ c(la) Rubus sp. (hispidus?)
✓ lc Danthonia spicata
^ Lycopodium complanatum
✓ c Solidago sp. (juncea? ~~[illegible]~~)

Label typed
40833 Antennaria
occasional in Pinus virginiana woods.

Fairfax Co.

vane on broken ground to pure Juniperus virginiana 1-2 m. apart, up to 10 cm. dbh. 8 m. tall. Here Rhus toxicodendron is much more abundant.

Open field with Andropogon nearby - invaded by Pinus virginiana and Juniperus. Underlined herbs from pine forest also seen here.

Another similar but denser patch of pine, with much less Lonicera and seeming less disturbed. Species seen here in list on pp. 157-9 marked ✓. Juniperus much less abundant and smaller

Ranunculus abortivus (fl)
Prunella vulgaris
Ascyrum hypericoides
Agrostis
Potentilla simplex (fl)

1960 Maryland - Penna.

April 29 - Pennsylvania Railroad Washington to Philadelphia

At Washington the trees are practically fully leafed out, ~~but~~ except for the oaks, but are still a light bright fresh green. The leaves of the oaks still hang down, are still dull and woolly in appearance, and perhaps half developed or less in size. Cornus florida is in full bloom. Paulownia in bloom.

State of leafing out in Philadelphia not perceptibly different from that in Washington.

1940 Florida

May 7 – Everglades Nat. Park.
"Marl" soil –
Distichlis flats.
Batis flats.

Mangrove which came in after 1935 hurricane – Rhizophora about 8 m. tall and 10 cm. diam. closed. trunks rather clumped, 1-2 m apart. seedlings abundant near edges. roots not quite contiguous.

Stand of Conocarpus rather open, with herb layer of Batis, Salicornia, Borrichia etc. Trees about 6 m. tall. Large blowdowns common.

Other stands of Rhizophora very dense, small poles 6 m. tall.

~~[illegible]~~ Conocarpus stands with dense Borrichia ground layer, even though canopy almost closed, but thin.

Tillandsia common on trunks.

Small meadows of Borrichia, Batis, etc.

Everglades

National Park, Florida

se
a
ia
(photos)
n.
es
bly
patches.
lement
ngrove
a,
between
sland. (photo.)
tered
ots)
lium –
red
p & 3 m.
all
s of
e
all
d
nd palms.

Everglades

National Park, Florida

Everglades
NATIONAL PARK

OPEN ALL YEAR

This southernmost tip of the Florida mainland was established as Everglades National Park on June 20, 1947, thus assuring the preservation of its unique biological features in their natural state for all time. Many people had contributed their time and efforts to accomplish this goal.

The park boundaries encompass more than 2,100 square miles of land and water. This vast wilderness, blending sea and sky in the distance, dips imperceptibly to the shallow waters of Florida Bay on the south and to the Gulf of Mexico on the west.

Threshold to the Tropics

In effect, Everglades is a mosaic of many interesting things, each strongly influenced by the tropical climate. Plants of the Temperate Zone meet plants of the Torrid Zone; fresh water meets salt water; and land meets sea. The grasslands of the true Everglades stretch across the horizon. Clusters of trees, called hammocks, resemble islands in the open Everglades and among the pines. Following the shorelines and growing upon keys (islands) in open water, mangrove forests form almost impenetrable thickets.

Warmed by the sun and nourished by the waters, the area is biologically fertile, supporting many interrelated forms of plant and animal life under natural conditions. Outstanding among the features of the park are the rookeries of birds.

Park rangers will assist you and give you information on what to see and do during your visit. The park naturalist staff conducts programs and walks designed to give you a better understanding of the wildlife, geology, plants, and history of the Everglades country. Schedules of these interpretive services are available at all ranger stations.

> The National Park System, of which this park is a unit, is dedicated to conserving the scenic, scientific, and historic heritage of the United States for the benefit and enjoyment of its people.

The Winter Season

Weather is normally pleasant and clear, with very little rainfall. Temperatures are often described as "about like June up north," and people dress accordingly. However, brief cold snaps do occur occasionally, sometimes bringing strong northerly winds and possibly frost.

This dry season is the best time to see the abundant wildlife, which tends to concentrate in sloughs, lakes, and other water areas. Many of the large, spectacular wading birds—egrets, ibis, herons, and roseate spoonbills—nest in their rookeries during midwinter and early spring. Waterfowl and other bird migrants from the north are in the park area.

Practically all trees, shrubs, and other plants stay green all winter, although the grasses and sedges of the Everglades take on brownish hues. Fishing is good, as a rule, but it is variable. Boating is generally good, but waters may become rough during this season.

The Summer Season

The majestic clouds of summer, though they may produce brief torrential showers, give a beauty to the landscape that you would miss in the winter. Wildlife is distributed over wide areas and is not so easily seen. Fishing is at its best, and the waters of the park are usually calmer than in winter. In the summer, you should bring insect repellant with you, for the pests can become bothersome.

Overnight Accommodations, Picnicking, and Camping

Overnight accommodations in the park are limited; therefore, you should make reservations well ahead of your visit in order to insure having a place to stay. You may reserve your accommodations by writing to Everglades Park Co., Inc., either at Flamingo, Fla., or at 3660 Coral Way, Miami 45, Fla. Also, you may telephone this company at either Miami or Everglades, Fla.

You may picnic at Flamingo, where drinking fountains, tables, charcoal burners, and restrooms are available; in the Long Pine Key area, where there are tables and toilets; and at Nine Mile Pond, where only picnic tables are provided.

You may enjoy camping at an improved campground at Flamingo; or you may prefer the less developed surroundings at Long Pine Key. Camping space is obtained on a first-come first-served basis and cannot be reserved. You may camp in the back country, but you must first get a campfire permit at park headquarters or at any ranger station.

Housetrailers are permitted in the campgrounds; however, electric, water, and sewer hookups are not available.

The labyrinth at the mouth of Shark River.

Roseate spoonbills. Courtesy, F.S.N.B.

If you plan an extended boat trip into park waters, you should obtain the necessary charts before starting. It is well to consult a park ranger and indicate your proposed route. You may purchase U.S. Coast and Geodetic Survey charts from authorized dealers in Homestead, Miami, and Everglades.

Boats for sightseeing and charter boats for fishing go out from Flamingo and Everglades. These are carefully inspected for safety by both Coast Guard personnel and park rangers. Reservations are usually necessary during the peak of the winter season. Names and addresses of authorized operators of charter boats may be obtained at park headquarters.

Food Service, Gasoline, and Miscellaneous Items

At Flamingo, you will find modern dining facilities and service stations for boats and cars. Also available at this newly developed area are boat rentals, bait, store supplies, and souvenirs.

A general-delivery post office is operated at Flamingo.

Help Us Protect the Park

To accomplish our objectives of protecting and preserving the wilderness, and to leave Everglades undisturbed for the enjoyment of our own and future generations, we must have park rules and regulations.

Everglades National Park is a sanctuary for all wildlife. Recent years of protection have made the wild creatures lose much of their fear of man. Therefore, we ask that you please not throw rocks or in any way attempt to disturb the birds, alligators, or any form of wildlife. Hunting or the use of firearms is strictly prohibited. Fishing is permitted in accordance with State laws.

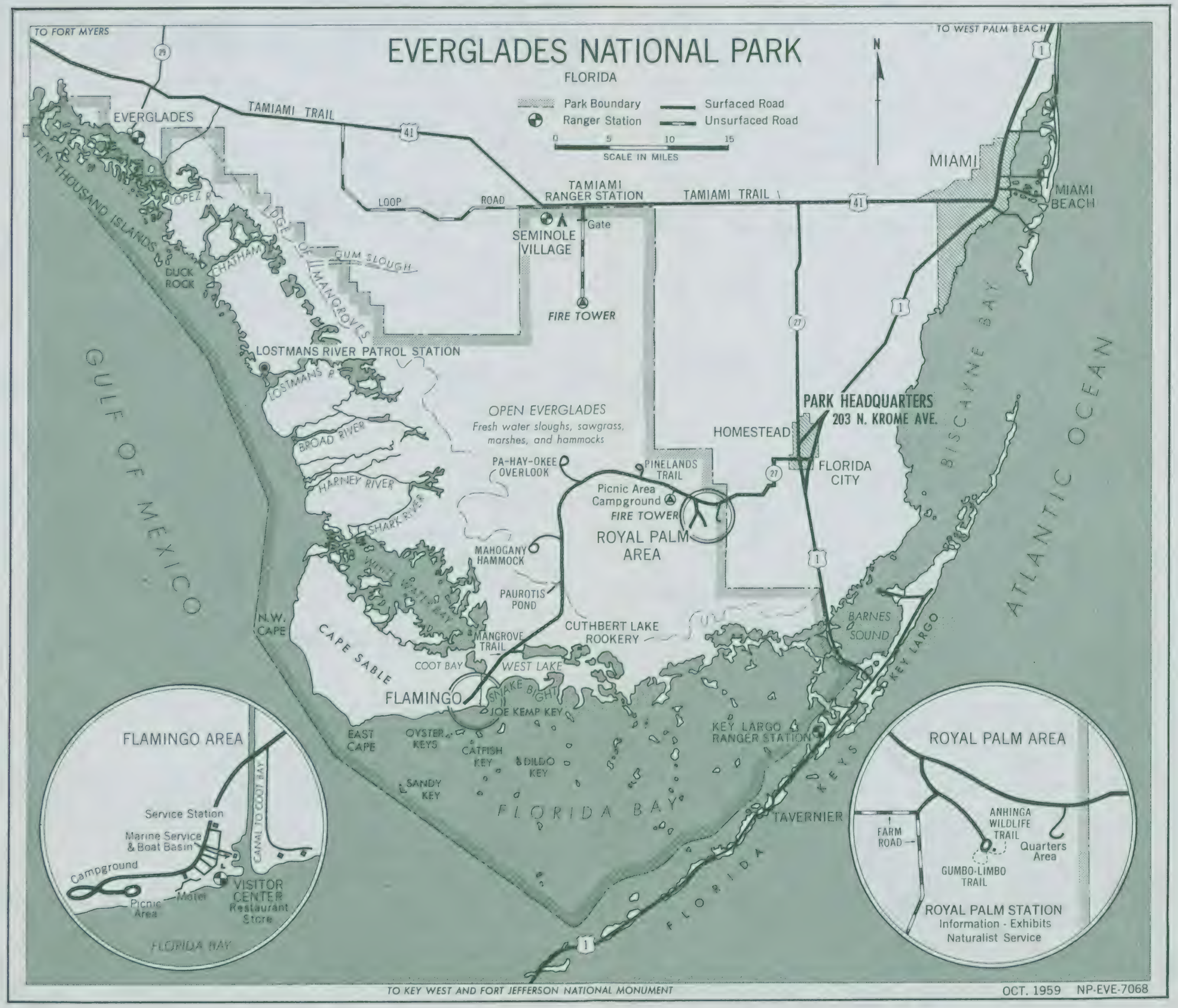
Trees, shrubs, airplants, orchids, and other plants must not be removed or disturbed—other visitors wish to see them, too.

Speed Limit

For your safety and for the safety of the wild creatures, the speed limit in the park is 45 miles per hour. You'll find that the more leisurely you drive, the more you will enjoy the Everglades scene.

Mission 66

MISSION 66 is a program designed to be completed by 1966 which will assure the maximum protection of the scenic, scientific, wilderness, and historic resources of the National Park System in such ways and by such means as will make them available for the use and enjoyment of present and future generations. Tangible evidences of the progress being made under the program here at Everglades include the new road, camping facilities, and the development at Flamingo.


EVERGLADES NATIONAL PARK
FLORIDA
Park Boundary
Ranger Station
Surfaced Road
Unsurfaced Road
0 5 10 15
SCALE IN MILES
N
TO FORT MYERS
29
EVERGLADES
TAMIAMI TRAIL
41
LOOP ROAD
TAMIAMI RANGER STATION
Gate
SEMINOLE VILLAGE
FIRE TOWER
TO WEST PALM BEACH
1
MIAMI
MIAMI BEACH
27
TEN THOUSAND ISLANDS
LOPEZ R.
CHATHAM
DUCK ROCK
EDGE OF MANGROVES
GUM SLOUGH
LOSTMANS RIVER PATROL STATION
LOSTMANS R.
GULF OF MEXICO
OPEN EVERGLADES
Fresh water sloughs, sawgrass, marshes, and hammocks
BROAD RIVER
HARNEY RIVER
SHARK RIVER
PA-HAY-OKEE OVERLOOK
PINELANDS TRAIL
Picnic Area
Campground
FIRE TOWER
ROYAL PALM AREA
MAHOGANY HAMMOCK
PAUROTIS POND
WHITEWATER BAY
CUTHBERT LAKE ROOKERY
MANGROVE TRAIL
N.W. CAPE
CAPE SABLE
COOT BAY
WEST LAKE
FLAMINGO
SNAKE BIGHT
JOE KEMP KEY
EAST CAPE
OYSTER KEYS
CATFISH KEY
DILDO KEY
SANDY KEY
FLORIDA BAY
PARK HEADQUARTERS
203 N. KROME AVE.
HOMESTEAD
FLORIDA CITY
BISCAYNE BAY
ATLANTIC OCEAN
BARNES SOUND
KEY LARGO
KEY LARGO RANGER STATION
TAVERNIER
FLORIDA KEYS
FLAMINGO AREA
Service Station
Marine Service & Boat Basin
Campground
Picnic Area
Motel
VISITOR CENTER
Restaurant
Store
CANAL TO COOT BAY
FLORIDA BAY
ROYAL PALM AREA
FARM ROAD
ANHINGA WILDLIFE TRAIL
Quarters Area
GUMBO-LIMBO TRAIL
ROYAL PALM STATION
Information - Exhibits
Naturalist Service
TO KEY WEST AND FORT JEFFERSON NATIONAL MONUMENT
OCT. 1959 NP-EVE-7068

Self-guiding Trails, Exhibits, and Facilities Along the Park Road

[Trails do not exceed 20 minutes walking time]

Miles from entrance to turnoff	
2	Royal Palm area: Royal Palm Visitor Center—exhibits, naturalist programs, restrooms. Anhinga Trail—a wildlife trail. Gumbo Limbo Trail—a jungle trail through tropical hardwood hammock.
4	Long Pine Key area: Campground—limited facilities. Picnic area—limited facilities, picnic tables, toilets.
6.5	Pinelands Trail—a pinewoods community trail.
12.5	Pa-Hay-Okee—boardwalk and tower for panoramic view.
19.5	Mahogany Hammock—elevated boardwalk into mahogany forest.
24.5	Paurotis Pond—parking for view of rare palms.
26.5	Nine Mile Pond—limited picnicking facilities.
30.5	West Lake area: Mangrove Trail—an elevated boardwalk into dense, tropical, mangrove swamp. West Lake Pond—Cuthbert rookery boat trip (Feb.–May), waterfowl.
38	Flamingo area: Exhibits, naturalist programs, marina, sightseeing boats, restaurant, motel, service station, picnic area, campground.

Administration

Everglades National Park is administered by the National Park Service, U.S. Department of the Interior, with headquarters at 203 North Krome Avenue in the business district of Homestead, Fla. For further information, call in person or telephone or write the Superintendent, Box 275, Homestead, Fla.

UNITED STATES
DEPARTMENT OF THE INTERIOR
Fred A. Seaton, *Secretary*
NATIONAL PARK SERVICE
Conrad L. Wirth, *Director*

U.S. GOVERNMENT PRINTING OFFICE : 1959—O-527192

Everglades

National Park, Florida

1960 Florida

May 7 - Everglades Nat. Park.
"Marl" soil -
Distichlis flats.
Batis flats.

Mangrove which came in after 1935 hurricane - Rhizophora about 8 m. tall and 10 cm. diam. closed. trunks rather clumped. 1-2 m apart. seedlings abundant near edges. roots not quite contiguous.

Stand of Conocarpus rather open, with herb layer of Batis, Salicornia, Borrichia etc. Trees about 6 m. tall. Large blowdowns common.

Other stands of Rhizophora very dense, small poles 6 m. tall.

~~B~~ Conocarpus stands with dense Borrichia ground layer, even though canopy almost closed, but thin.

Tillandsia common on trunks.

Small meadows of Borrichia, Batis, etc.

Mangrove trail
board trail in dense stand of Rhizophora 6-10 m. tall with scattered Avicennia
Root tangles dense (photos)
Acrostichum common.

Some low mixtures of Cladium and shrubby mangroves.

Saw grass marsh patches.

Along road embankment
Bidens pilosa var.
Cynodon dactylon, etc.

Much low mangrove scrub - Rhizophora, with open water between clumps.

Paurotis clumps on island (photo.)

Marsh with scattered tiny mangroves. (photo)

~~Coast~~

Large areas of Cladium - drab green. Scattered small Taxodium up to 3 m. tall. Scattered small hammocks or patches of shrubs. with dense undergrowth of small fan palms (Serenoa)

Sparse pine-land with saw-grass and palms.

Pine hammocks
are small patches of
this with brush and palms

Mahogany ~~Hammock~~-
Patch of dense low
forest, very mixed,
with scattered fair
sized Swietenia trees,
tall Sabal, Metopium,
Eugenia, Ardisia, ~~Ilex~~ mastic, Bursera.
Acrostichum and
Blechnum(?) on ground.
Epiphytic Tillandsia,
Polypodium polypodioides,
Orchids, Nephrolepis.
Striking strangling
figs (F. aurea)
Exothea

Coccoloba
Chrysophyllum
Calyptranthes

Open scrub or scrub- forest or shrub -savanna
of small cypresses 2–5 m. tall
over considerable area.
Areas of open pine-lands
more and more common
northward. Pines mostly
small, widely spaced.
Low scrub layer dense.

All the palms seem to
be in flower.

Anhinga Trail –
Patches of thicket of
Salix, patches of reed,
and areas of open water
with luxuriant Nuphar.
Cephalanthus, Annona
glabra occasional.
Anhingas, redwing
blackbird, alligator,
bull frog, and gar-fish

cardinals

1960 Florida

May 8 - ~~Miami~~ Coconut grove - boat landing on shore near Mathieson Hammock.

An irregular maze of filled land, open water and mangrove swamp.

The swamps are dominated by Rhizophora mangle, small trees 2-10 cm dbh 2-8 m. tall. crowded, spacing 0.3 - 3 m. arching aerial roots forming a tangle about 1 m. high, some roots higher. some trees also sending down vertical roots from the branches as high as 3 m.

In these swamps are scattered trees of Avicennia and Laguncularia, both sending up numerous vertical finger-like "knees" a few inches high all over the ground around their bases. Nothing else seems to grow in the actual swamps. In the margins Conocarpus erectus trees or shrubs of 2 forms, a glabrous green one and a sericeous one, Coccoloba uvifera, and Thespesia populnea (one tree seen) are found, in places prominently.

Also in the margins are Lycium sp., Borrichia frutescens, Sesuvium portulacastrum, Thunbergia alata(?), and in small open spots, Batis, Salicornia, Paspalum distichum (?), Euphorbia spp. Portulaca oleracea (large fls.), etc.

Around park hq. Pandanus tectorius, Ochrosia elliptica, Ficus sp., Schinus terebinthifolius, ~~and~~ Coccoloba uvifera, Myrsine sp. & Stenotaphrum secundatum are planted - also Zoysia tenuifolia.

In mangrove swamp the trees are somewhat irregularly clumped. Many seedlings. Many old wind thrown trunks tangled in the aerial root layer.

Landward along the road the mangroves become smaller and the vegetation changes to a scrub, still principally Rhizophora, 1-3 m. tall. Still farther toward the land this thins out. ~~Laguncularia~~ Juncus (drummondii?) becomes abundant with the mangroves. Then the Rhizophora becomes less abundant and the

Laguncularia becomes abundant. The Juncus drops out and the scrub becomes more irregular and sparser.

Then there is an area cleared for picnicing.

Then the hammock begins and extends to the highway.

This is on slightly higher ground where the surface is a moderately irregular one of a sponge-like oolitic lime-sandstone.

Here the vegetation is a gnarled, twisted low forest, 6-8 m. tall, with a mixture of broad-leaf trees up to 3 dm. dbh but mostly 6-12 cm. or smaller, spaced 1-2 m. apart, with a conspicuous surface layer of roots. The undergrowth is moderate, of saplings and shrubs (Psychotria, Serenoa Nectandra?, Eugenia etc.) 1-2 m. tall. scarcely any herb layer, (only a few seedlings of larger plants), thin moss, lichen and algal color on the rocks. A few epiphytes

(Tillandsia, mosses) in the trees. Lianas common.

Bursera is a common and conspicuous tree.

The aspect is of a dense tangled thicket, but one may walk freely through it in most places where Smilax is not abundant.

A small Zamia is occasional.

Patches of Oplismenus, occasional Panicum.

Sabal, Coccoloba heterophylla(?), Ardisia, common, also Quercus virginiana at least in edges.

On slightly higher ground to north of this are areas of open to closed scrub of Lantana, Rhus copallina, palms, and various other shrubs with scattered Quercus virginiana and Pinus.

This grades to open pineland-grass with scattered shrubs, palms and pine trees, and to open pine forest with Serenoa + grass.

All of this oak pine complex appears to be on a very broad beach ridge, this at least locally consolidated

1960 Florida

Labels typed

May 8 - Matheson Hammock
Coral Gables, south of Miami
~~Mesophytic evergreen~~
~~forest~~

40834 Psychotria
common in mesophytic
evergreen forest

〃 35 Euphorbia supina?
common on fill of crushed
oolitic limestone.

〃 36 Conocarpus erectus
common, edges of mangrove
vegetation.

〃 37 Phragmites
occasional on limestone fill

〃 38 Randia
common in open pine forest.

〃 39 Hedyotis
open sandy pine forest

Dade Co.

shrub 1 m. tall; flowers white.

shrub 2 m. tall, silvery-silky.

clump 2 m. tall.

shrub 1 m. tall; flowers
fragrant, white.